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AMERICAN ARTISAN and Hardware Record

Vol. 79. No. 24. 620 SOUTH MICHIGAN AVENUE, CHICAGO, JUNE 12, 1920. $2.00 Per Year.

5 Big Reasons Why

GLOBE

PIPELESS FURNACES

Sell Easily—and Stay Sold

(1) *No Pipe Lines, Therefore Economical to Install*

No tearing up of floors, no mutilation of walls or ceilings, nothing disturbed. Can be installed in a few hours at slight cost. Installed as easily in shallow as in deep cellars.

(2) *Heat Every Room Evenly and Thoroughly*

The clean, moist, warm air rises and circulates evenly and thoroughly throughout the entire house—large or small. As the air cools, it is drawn into the furnace, reheated and sent upward again.

(3) *No Dust, No Dirt*

A big selling feature! Tight-jointed casings made of Armco Iron enclose the entire furnace, preventing dust, dirt, or soot from being drawn in and sent upstairs to settle on floors, walls, and furniture.

(4) *Burn Any Grade Fuel*

Hard, soft, slack coal, screenings, wood, or coke—all burn equally well in the Globe Pipeless Furnace. The scientific construction of the fire-pot enables this furnace to get **all** the available heat out of any kind of fuel!

(5) *Reduce Fuel Bills 35%*

First, because the large combustion chamber is designed to turn coal gases into heat. Secondly, because the fire-pot is constructed with slots. Every pound of fuel gives up all its available heat—none of the energy is wasted.

Send for Complete Dealer Information

Let us show you how easily Globe Pipeless Furnaces sell—why they stay sold, create good-will, and bring other good business to Globe dealers. Learn just how you can build up a profitable and substantial pipeless furnace business this season. Send for full information at once.

THE GLOBE STOVE & RANGE CO.

"Master Furnace Builders"

Dept. K-1

KOKOMO, INDIANA

Als **makers of Globe Fuel-Saving Stoves and Ranges**

Published Weekly. Entered as Second-Class Matter June 25 1885 at the Post Office at Chicago Illinois under Act of March 3rd 1879

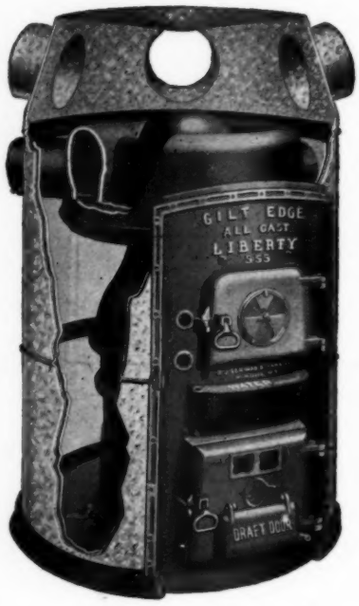
ALPHABETICAL INDEX AND CLASSIFIED LIST OF ADVERTISERS, Pages 68 and 69

SIX BIG SALES POINTS

Make the GILT-EDGE a Winner

You get an immense sales leverage when you offer your customers the furnace with six special sales features.

1. Large heating surface and long fire travel.
2. Extra large free air spaces.
3. Anti-clinker grate,—fire can't be dumped into ash-pit.
4. Large ash-pit—won't burn out grate.
5. Extra heavy fire-pot—cast in two pieces.
6. Large water pan.



GILT EDGE LIBERTY FURNACE

is backed by years of furnace building experience. Many Gilt-Edge furnaces have been in successful and continuous use for 30 years.

We help Gilt-Edge dealers with sales literature of an unusual type that goes direct to the dealer's prospects.

R. J. SCHWAB & SONS CO.

283 Clinton Street **Milwaukee, Wisconsin**

ESTABLISHED 1880
Representative of
The Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

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Speculation and Profits

IN TIMES OF peace, the law of supply and demand regulates prices of commodities. The frequency with which a merchant can turn over his stock determines how closely he can follow the market and thus keep in agreement with the trend of prices. The best controlled business, of course, is that in which there is a rapid turnover, for it gives more frequent use of capital, and on a smaller percentage of profit produces a larger income on working capital, and goes back to the old slogan of "quick sales and small profits." On the other hand a merchant who is able to read market signs correctly and is able to stock up in advance is usually regarded as a good business man, and by the general laws of business is entitled to larger profit on his transactions.

In the first place he locks up his capital for a considerable period and is thus prevented from turning it over to reap the accumulation of smaller profits which he might otherwise do, and in ordinary justice he would be entitled to at least a sufficient profit on slower transactions to equal what he would obtain by several turnovers of the same capital. He should also be entitled, by the same laws of business, to a greater profit, because of the risk involved, for it is equally possible that the transaction could go in the opposite direction, and for him to sustain a loss in place of the expected profit; and profits are usually reckoned upon the basis of risk involved.

These, of course, are fundamental principles, and should be considered apart from that which is straight profiteering. It is sometimes very hard to draw the line between legitimate profits and profiteering, and the general rule at present, both in the popular mind and with public prosecutors, is to consider the size of the profits prima facie evidence of profiteering. There is no reason why in these, as in other actions, the intent should not be taken into consideration. When demand exceeds the natural supply, prices are sure to advance, and if the original holder does not reap the benefits of the advancing market, subsequent purchasers are pretty sure to do so for the merchandise is apt to pass through several hands, if it is obtainable below the regular market price, before it reaches the consumer.

It is quite another matter when the supply is artificially reduced, or its immediate availability interfered with, in order to force prices upward; as for instance, hoarding of foodstuffs or other commodities by speculators. It is here that the question of moral purpose enter in. Anyone who will deliberately withhold supplies from the market in times of scarcity should be made to feel the full force of the law.

Yet there is a form of speculation on which the welfare of the community depends. The wholesale dealer in seasonal commodities is conferring a public benefit in purchasing and storing such goods against their later distribution. This is a form of speculation because in making his purchases he is forecasting to the best of his ability what the future market will be. It is quite possible, and very often happens that new circumstances arise between the times of purchase and sale which turn his expected profits into losses. He could not be induced to make such investments and to lock up his capital for such a period of time unless he had the incentive of substantial profits in prospect.

Yet some one has to do this very thing. Our great storage warehouses, both of the regular type and of the cold storage variety, afford machinery by which this is possible of accomplishment. The producer has no such facilities at his command, nor can he command the capital. If by cooperative effort he is able to provide such facilities, he himself becomes a speculator of the legitimate type, and it is generally recognized in these days that the producer is the one properly entitled to obtain such benefits.

* * * * *

It Pays to Coöperate.

THE BEST PROOF of the benefits of cooperation is the general industrial advancement which has already taken place through coordination of effort and resources. A hundred years ago factories worked with water-power. Water-power, like the use of sails at sea, is obviously the cheapest kind of power. But the world set it aside for steam, which enabled industry to achieve the economies of high-power, intensive efficiency through rapidity of production and concentration of great aggregations of machinery. Lately, electricity is supplementing and limiting the employment of steam for the same reasons. The current is generated by water power and by steam, but it enables a higher concentration of great power into a small space and into a moment of time.

Now the internal-combustion engine using oil or coal-tar products for fuel is coming in to supplement electricity, as a means of high concentration of efficient motive energy in circumstances where the use of electricity is impracticable, at least for the present. The aeroplane was impossible in the day of water-power, steam, and electricity. It came with the development of the high intensive power of the internal combustion engine.

There are certain degrees of efficiency in the machinery of business, whether industry, transportation, or selling is involved, that are unattainable except by intensive organzation, and the economies of this efficiency are such as to set asde mere obvious cheapnesses of the awkward operation of less highly organized business. In the remarkable development that is in progress in this country today, we are striving for these high-power, intensive efficiencies in order to achieve their superior economies.

We are putting together great aggregations of different kinds of business for purposes of world-wide expansion in such a way that the combinations may reach these intensive efficiencies. It is found that sometimes two entirely different kinds of business activities are dependent on each other, and if they can be brought into community of interest and of management they can be made mutually paying when they might not pay as independent enterprises.

On a smaller scale, but none the less effectively, coordination of thought and effort has developed the hardware sheet metal and furnace trades to national proportions. By means of associations, business men in these trades have made wonderful improvements in their methods of merchandising. There remains much to be done, however, and cooperation is the most powerful force for its accomplishment.

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Cost of Cutlery Goes Up.

WAGES IN THE cutlery industry take another jump, according to the American Cutlery Bureau of Information, standing to-day highest since the summer of 1914, with a total increase of 176 per cent against pre-war figures. Cutlery making, notwithstanding its many industrial improvements, is still essentially an artisan industry requiring the highly skilled operative more than most other industries. The percentage of wage upon the cost of production in the cutlery industry in fact is unusually high, running in some cases up to 75 per cent of the total value of the manufactured article. Wage advances in the American cutlery industry have generally been more pronounced than those in other countries. In England the average wage addition in that industry has been 150 per cent with larger additions in the instance of operations where special skill is required.

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Review of Conditions.

THE MERCHANT WHO does not keep himself informed concerning the main currents of finance and industry is doing business in the dark. The more he knows about economic conditions and changes the less likely is he to make costly blunders in buying or selling. There is value, therefore, to every retailer in the monthly bulletin of the Federal Reserve Board because it supplies the general information which he needs. The bulletin states that changes in prices, as well as in both business and credit conditions, occurring during the month of May have borne witness to the presence of disturbing factors, whose importance and persistence are, however, as yet uncertain.

Local reductions in retail prices have occurred at a considerable number of points and have at least suggested the advent of a serious modification of the price level throughout the country. More careful analysis has shown that there has been no material alteration in the underlying conditions affecting the situation, there being no decided increase in the volume of production sufficient to create a more normal relationship with consumption, no substantial change in the volume of credit extended, and no greater disposition to economize and invest than heretofore. The changes that have taken place can not, therefore, be looked upon as indicating a modification of underlying conditions. They may, however, afford a basis for changes in business relationships that may broaden into more far-reaching alteration of the essential price structure.

"The continuance of labor difficulties and unrest," says the report, "particularly in connection with the railroads, when added to the difficult situation produced by car shortage and lack of equipment, has caused considerable interruption to business operations, and the whole outlook has been such as to bring about a severe curtailment in the volume of stock and securities transactions and to compel very material lessening in the market value of Liberty Bonds and of other securities of the first grade.

"The arrival of the time for active effort in connection with crops has introduced a new factor into the situation in those districts where agriculture is the chief industry. In the cotton region the movement of the 1919 crop has continued to slow up, while farming conditions in the southwest have not been very favorable. Planting is late and much replanting has been found necessary. Undue drouth has been only partly relieved. Livestock ranges are in fair to good condition and the condition of animals is reported good."

Building activity continues well sustained in many sections, although seriously curtailed in certain districts, such as Chicago, by the shortage of materials and by increased prices. From several districts it is reported that new construction is largely confined to business building as against construction for housing purposes.

The labor situation during the month has been one of the outstanding elements of doubt and difficulty. In addition to intense shortage of labor on farms and at other points of primary production, sporadic strikes in many lines of manufacturing notably textiles, have continued to indicate unrest. Wages have apparently fallen behind the advance in prices and cost of living.

The movement of labor from the farms to the cities is continuing. Various demands for higher wages have been taken under advisement for the purpose of bringing about compromise adjustments between employers and employes. General complaint of low efficiency or small output per unit of labor continues to be prevalent. The difficulty of getting skilled labor in some of the more highly developed lines of manufacture is very considerable.

"The financial occurrences of the month have been of first importance," declares the bulletin. "In addition to a heavy decline both in volume and value of securities in the financial centers, there has been a general tendency to revision of interest rates. This has applied both to call and time funds and to rates

for commercial paper. No material change in rediscount rates at Federal Reserve banks has occurred, but an effort to limit credit to essential necessities has been general."

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RANDOM NOTES AND SKETCHES.

By Sidney Arnold.

My friend George R. Carter of the Swift-Cope Company, Incorporated, Detroit, Michigan, declares that this is, indeed, a dirty-looking old world to the fellow who is too lazy to clean his spectacles.

* * *

An editor received this letter from a fresh youth:

"Kindly tell me why a girl always closes her eyes when a fellow kisses her."

To which the editor replied:

"If you will send us your photograph we may be able to give you the reason."

* * *

Here is a bit of conversation overheard by my friend "Uncle Dirk" Meyer of the Meyer Furnace Company, Peoria, Illinois:

"What's the matter with your wife? She seems all broken up lately."

"Well, she had a terrible shock."

"Why, what happened?"

"She was assisting at a rummage sale. She took off her new hat and somebody sold it for 30 cents.

* * *

I owe thanks to my friend J. V. Armhorst of the Chicago office of Merchant and Evans Company for the following:

One of the wealthy men of a western city whose education is not as comprehensive as his business instinct, recently visited Washington and, incidentally, some of the historic towns of interest thereabout.

"Here," said a guide to him one day, "right here in this room, sir, George Washington received his first commission."

Whereup the man of wealth brightened up. "Do you happen to know," he asked, "what per cent commission it was?"

* * *

From "the dear, dead days beyond recall" is this bit of humor supplied by my friend John Bogenberger, chairman Ways and Means Committee of the Master Sheet Metal Contractors' Association of Wisconsin, Milwaukee, Wisconsin:

"Ma," roared Mr. Jagsby, "where in the demnition bowwows is my hat? I can't keep a thing about this house. It's a shame the way things disappear without any apparent reason. I would just like to know where that hat is."

"So would I," replied Mrs. Jagsby, coldly. "You didn't have it on when you came home last night."

* * *

The Chinaman is too polite to say anything that might give offense to another. Here is said to be a Chinese editor's letter of rejection: "I have read your work and am delighted with it. Nay, I swear by the sacred ashes of my forefathers that never in my life have I read anything to excel its merits. That is why I am afraid that His Majesty, our exalted Emperor and Sire, would become so enthused over it, should we print the work, that he might forbid us ever to have anything printed hereafter that did not approach this superb masterpiece. And since in the next one thousands years another work of equal value can hardly be expected, we herewith return your divine manuscript to you with infinite regret and beg your forgiveness for doing so."

* * *

My friend John R. McCrea of Pittsburgh, Pennsylvania, commends the following dialogue to those who are fighting race suicide:

"You say you are Mrs. Gadder's family physician?" said the Man. "Why, I thought you were a veterinary surgeon."

"I am," replied the veterinary surgeon, "Mrs. Gadder's family consists of a French poodle."

* * *

Allan J. Coleman, president of the Hardware Club of Chicago, relates this example of laziness:

A lawsuit was recently in full swing and during its progress a witness was cross-examined as to the habits and character of the defendant.

"Has Mr. M——a reputation for being abnormally lazy?" asked counsel, briskly.

"Well, sir, it's this way——"

"Will you kindly answer the question asked?" struck in the irascible lawyer.

"Well, sir, I was going to say it's this way. I don't want to do the gentleman in question any injustice. And I won't go so far as to say, sir, that he's lazy exactly; but if it required any voluntary work on his part to digest his food—why, he'd die from lack of nourishment, sir!"

* * *

We need to get the war psychology out of our thoughts. Peace and prosperity in commerce and industry require good fellowship. Enmity and rancor are forces of disorder in life. They inspire strikes and lockouts. Class divisions follow. People are separated instead of united for the common good. Let us foster the spirit of friendship and brotherhood, taking to heart the lines of the beloved California poet, Joaquim Miller:

Is It Worth While?

Look at the roses saluting each other;
Look at the herds all at peace on the plain,
Man, and man only, makes war on his brother
And dotes in his heart on his peril and pain,
Shamed by the brutes that go down on the plain.

* * *

If I were asked to state what I consider the most important faculty of human nature, I would not hesitate to specify the imagination. This is a power truly magical. It deepens, broadens, and enriches life Daily and hourly it works the miracle of happiness in the poorest circumstances.

A Little Imagination.

A little imagination, and dreariness falls away,
And that which was toil and trouble is suddenly turned to play;
A little imagination, and hunger and thirst and pain
Are lost in beautiful visions of manna and dew and rain.

A little imagination, the sordid and dry and stale
Turn to a mystic morning gleaming a fairy vale;
A little imagination, and that which was only strife
Walks over the hills of the commonplace unto the gardens of life.

UP TO THE MINUTE NEWS SIFTINGS

FEDERAL TRADE COMMISSION MAKES REPORT ON PRICE ADVANCES OF KEROSENE AND FUEL OIL.

The Federal Trade Commission recently delivered to Congress its report in response to House Resolution No. 501, April 5, 1920 (Congressman Dyer of Missouri) which directed the Commission to investigate the causes of the advance in prices of gasolene, fuel oil, kerosene, and other refined oil products; and to report also as to any combination or restraint of trade existing in the industry, as to profits, and as to the sources of crude oil supply of the United States.

The conclusions of the Commission may be briefly summer up as follows:

1. It seems that there is greater justification in assigning the advance in price of crude oil and petroleum products to varying conditions of supply and demand in the light of emphasized and pessimistic statements as to future of supply, than to a combination in restraint of trade. The Commission has previously reported upon competitive conditions in the oil industry. Nothing has been developed in the course of this inquiry which shows a change in the conditions so reported.

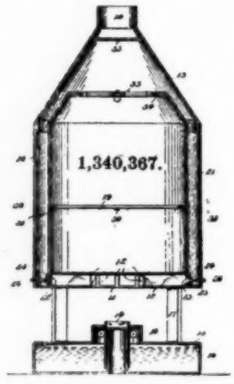
2. It is probably true that the recent advances in the prices of petroleum products (gasolene, kerosene, gas oil and fuel oil and lubricants) have been due primarily to the strong demand for such products coupled with the difficulty of many companies in getting adequate supplies of crude oil, the increased prices thereof and the increase in other expenses of operation.

3. The explanation of the men in the oil industry regarding the reasons for the advances in the prices of crude oil—namely, the strong demand for crude oil, the decline in stocks, the increasing consumption during the last half of 1919, and the decreasing production during the last quarter of 1919, the increased costs of drilling and producing crude oil and the unfavorable developments in the Mexican oil field—has substantial force, especially in 1919, but should be noted that the conditions in 1920 appear to have greatly improved with respect to production and imports. It is also the opinion of the Commission that the psychological factors in the situation were more important than the actual statistical position, the mental attitude of the oil trade being strongly affected on the one hand by the frequent statement that there was an impending decline of production in the United States, which was aggravated by the sudden slump of North Texas output in the middle of 1919, and by the unfavorable development industrially and politically in Mexico in the autumn of that year.

4. Taking the refining branch by itself, it is not possible to say at present whether the advance in the prices of petroleum products (gasolene, kerosene, gas oil and fuel oil and lubricants) were disproportionate to the advances in crude prices, because this question can only be determined from the aggregate profits of operation of refineries and the available data so far obtained are inadequate to answer the question. For the same reason it is impossible to show what the profits of the integrated companies (which have a large crude production of their own) have been in 1920, though in 1919 the profits of many of the large oil companies, whether producers, refiners or distributors of oil, were large.

GETS PATENT RIGHTS FOR A STOVE.

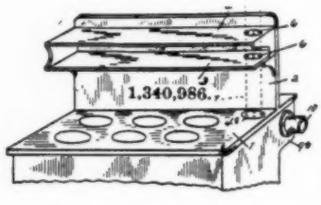
John Bilan, Flint, Michigan, has procured United States patent rights, under number 1,340,367, for a stove described in the following:



A stove comprising a fuel burner, vertical legs carried by said burner, a casing mounted on the upper ends of saids legs above the said burner, an oven within said casing and equally spaced from the walls of the casing, a depending annular flange upon said oven resting upon the casing and having heat passage openings therein, an arcuate damper slidably associated with said flange, contacting the same throughout its length and having openings therein adapted to register with the flange openings, outwardly directed spacing feet carried by the damper and resting upon the casing bottom and contacting the inner wall of the casing to hold the damper in engagement with the oven flange and an operating handle for the damper carried thereby and projecting outwardly of the casing.

SECURES PATENT FOR A RANGE.

Under number 1,340,986, United States patent rights have been granted to Henry D. Schall, Detroit, Michigan, assignor to Detroit Stove Works, Detroit, Michigan, a corporation of Michigan, for a range described herewith:



A stove provided with a plurality of openings for connection with a stove pipe, and formed with a depressed seat surrounding each opening, and a closure and a stove pipe collar, alternatively detachably engageable with said seats.

THE WEEK'S HARDWARE RECORD

Of Interest to Manufacturer, Jobber and Retailer

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing western hardware and metal prices corrected weekly. You will find these on pages 63 to 68 inclusive.

The Carpenter Hardware Company has increased its capital from $50,000 to $60,000, at Athens, Ohio.

The Smith Brothers Hardware Company has increased its capital stock at Columbus, Ohio, from $500,000 to $750,000.

The F. Rassmann Manufacturing Company, agricultural tools is increasing its foundry capacity at Beaver Dam, Wisconsin.

Fred Reule, incorporated, has increased his capital stock of hardware and implements at Lafayette, Indiana, from $15,000 to $100,000.

The Smith Brothers Hardware Company, wholesalers, of Columbus, Ohio, have increased their capital stock from $500,000 to $750,000.

The Central Steel and Wire Company, of Chicago, Illinois, has purchased a site, 260x432 feet, on which it plans a warehouse at a cost of $400,000.

The Butler Elliptical Wrench Manufacturing Company recently was organized with a capital of $25,000, by Willis Abbott and others at York, Pennsylvania.

Minteer Hardware Company has been incorporated at Oklahoma City, Oklahoma, with a capital of $250,000, by E. D. Minteer, Oklahoma City; J. C. and E. R. Minteer, Norman, Oklahoma.

The Lakewood Screw Machine Products Company recently was incorporated with a capital of $10,000 at Cleveland, Ohio, by M. Smith, K. G. Dean, H. G. Selby, F. W. Mould and S. A. Davies.

The Henkel-Clauss Company of Fremont, Ohio, one of the largest cutlery concerns in the United States, is undertaking to have nearly one hundred houses constructed in Fremont to provide homes for employes.

Landers, Frary and Clark, New Britain, Connecticut, manufacturers of cutlery, hardware, etc., have acquired the plant of the Capitol Glass Works, Vineland, New Jersey, as a branch works. The factory will be used for the manufacture of bathroom fixtures, vacuum bottles and other specialties.

HARDWARE MAN'S WIFE ASSISTS HIM IN PLANNING GAINFUL SALES.

Women are true analysts of human nature. Almost instinctively they select the most effective means of merchandizing. They know precisely what features of a window display, for example, have power to draw the passer-by into the store. They are more observant than men and quicker to detect exaggeration and insincerity.

O. W. Dressler, who has recently closed a deal whereby he became owner of the hardware and implement store at Weyerhaeuser, Wisconsin, fully appreciates these qualities of womanhood. From the beginning of his career in the hardware business three years ago, he has consistently sought the advice, suggestion, and assistance of his wife in planning gainful sales with results that have been, and continue to be, highly satisfactory.

In connection with his new enterprise, at Weyerhaeuser, Wisconsin, he carries a general line of hardware in addition to farm implements. He finds a growing demand for automotive accessories in his territory, and in co-operation with his clever helpmate takes special pains in designing sales-producing window displays.

Mr. Dressler conducts a tin shop in connection with his business and a house furnace installation department.

He is thoroughly convinced of the necessity and advantage of the good roads movement.

He has had gratifying success in the use of carefully prepared mailing lists and intends to do a good deal of direct by mail advertising in promoting his business at Weyerhaeuser.

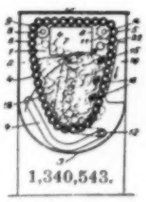
A really successful merchant is one who keeps constantly in touch with his fellowmen and who develops strong friendships.

Mr. Dressler belongs to the Masonic Fraternity and is a member of the Independent Order of Foresters, the United Commercial Travelers and the Mystic Shrine.

He believes that a business man's income is dependent upon many factors, the chief of which, in his opinion, is study of new ideas in merchandizing. He is a close and earnest student of trade journals and considers them of prime helpfulness in keeping abreast of the times.

WASHING MACHINE IS PATENTED.

Under number 1,340,543, United States patent rights have been granted to Alfred Hofmann, Zurich, Switzerland, for a washing machine described as follows:


1,340,543.

A machine for washing laundry goods, comprising a trough, an endless pervious band mounted in said trough and adapted to carry the laundry goods and to form together with parts of the trough a container for the said goods, means for raising, pressing together and releasing from pressure the part of the said band which carries the goods in such a manner as to move over each other, press and release from pressure the said goods, means for moving forward step by step the said band, so as to turn the

said goods, and means for returning to the upper part of the said trough the liquor which flows through the said band.

A machine for washing laundry goods, comprising a pluraliy of troughs mounted one above the other at an inclination which alternates in direction from trough to trough, an endless pervious band mounted in each trough, levers mounted in each trough and adapted to lift the said band, a power driven shaft and separate driving mechanisms adapted to transmit the movement of the said shaft to the said levers in each trough.

ARRANGING HARDWARE STORE INTO DEPARTMENTS ADDS TO ITS SELLING EFFICIENCY.

Because a hardware store is small is no reason for the lack of systematic arrangement of its merchandise. The idea of departments which facilitate handling customers should receive the earnest attention it deserves by the merchant who wants to be up to date in merchandising his wares no matter how small his store.

Systematically arranging the various departments of a store does not mean the putting of a fence between the different lines of goods you carry, and giving a certain salesman the exclusive selling of a particular line. It means that as many goods of a certain character as possible should be displayed and stocked in a certain portion of the store, so that it might assume the dignity of a department.

The proper method of displaying and carrying stock is necessary in all hardware stores. It can be applied in any store, large or small, in village, town, or city, without the expenditure of a great amount of money. The increased sales created by a proper and modern method of display and carrying stock will more than compensate the merchant for the cost of installation. There have been cases where articles called for were in stock, and possibly slow sellers, yet the slip-shod method of stocking the goods made the finding of them impossible and caused customers to go away dissatisfied, while with a system absolutely guaranteeing the certainty of finding the articles in the smallest fraction of a minute the earning power of the store thus equipped is enhanced.

Departmentalizing the store can be done in many ways. However, the best method is to show the most attractive goods, such as silverware, nickel plated ware, cutlery, cut glass, etc., in the most conspicuous part of the store, namely, right inside the entrance—in the middle, if possible. On one side it is best to have to the front the tool department, displaying all the small tools in the most attractive way possible, bringing up the rear with the larger and bulkier tools. On the same side should be shown the many small articles, such as padlocks, cabinet hardware, bright wire goods, brass trimmings, and the one thousand and one little articles not classified. For convenience this department should be named the "Miscellaneous Hardware Department."

It is a good plan to arrange the builders hardware next to the miscellaneous articles. The two should be connected, in a way. On this entire side display boards should be used. It would be only a gradual transition from one line to the other, they being so closely allied to one another.

The attractiveness of sporting goods should give them a prominent place in the arrangement of the departments. Fishing tackle, rods, bicycle sundries, etc., can be made to look well in wall cases. Bicycles, motorcycles, baseball bat stands, etc., can be given prominent floor space. To the side of the sporting goods department should be placed the "House Furnishing Goods Department" as the floor space in the center of the store immediately opposed could be utilized for the "Stove Department."

In season the stove department should be made the attractive center. The same can apply to each department. When the time of the year arrives in which the demand for a particular product is accentuated, that article should be played up.

The foregoing will amply illustrate the manner in which the hardware store can be advantageously arranged in departments. The outline given, however, is not exhaustive. Individual requirements and circumstances will go a long way in determining the position of certain departments.

Where expedient each department should be put in charge of one man. Or, if the sales force is small, a number of similar departments should be placed under the direction of one clerk. By this means each employee can develop his ability in the management of the department over which he has supervision.

COUNSELS GOOD PAINT ADVERTISING.

The retail paint trade of the country could easily be doubled. That may sound optimistic but it is admitted by business men that demand can be created where need exists. If anybody does not believe that the need for more paint exists, let him casually observe the interiors and exteriors of buildings he passes or enters.

Paint dealers should use more "Reason Why" copy. There is a tendency merely to mention the brands handled and to claim that "we have the best paint" rather than to give reasons why paint should be used.

For instance, most people have a wholesome dread of disease. How many paint dealers call attention to the fact in their advertising that paints are sanitary agents? That the vapors of drying paint possess real germicidal value in addition to smoothing the finished surface so that no lodging place remains for bacteria, dust and dirt.

The health appeal will sell paint to many people that the beauty and surface protection appeal will not influence.

However, there should be more than one string to the paint dealers' advertising bow. One advertisement should feature beautiful appearance; another economy in surface protection; another the health and cleanliness features. One appeal will catch one property owner; another some other one.

The best baseball pitchers believe in mixing 'em up, in having a large repertoire and serving the batter with something different every pitch. The paint dealer

could take pattern after the pitcher and vary his advertising to use all of the numerous appeals that will induce paint purchases. If this were done, it's a cinch that the assertion in our first paragraph that paint sales could be doubled would be realized.

PATENTS HAND SOLDERING TOOL.

United States patent rights have been procured by Samuel Davies, Eltham, England, under number 1,341,497, for a hand soldering tool described as follows:

In a hand soldering tool, a frame, a reservoir for receiving solder, means for fusing the solder and heating the bit, a swivel lid to said reservoir, an actuating arm on said lid, a catch on the frame to engage said arm, a tubular channel for receiving the melted solder, a valve-rod extending through said channel to the nose of the bit, and a valve formed at an intermediate point on the valve-rod, said valve being longitudinally channeled to provide a passage for the solder.

SALE OF FARM EXPLOSIVES CAN BE INCREASED BY PUBLICITY.

The chief source of the prosperity of a retail business lies in its volume of sales. Anything, therefore, which increases the number of sales of a given commodity adds to the profits. A source of profit which is capable of development is the sale of farm explosives. By using the right kind of publicity the sale of farm explosives can be greatly enlarged. Planting trees by the aid of farm explosives is one of the new ways for increasing sales.

Park Commissioners are supposed to be pretty wise in matters pertaining to trees, but the more open minded among them are constantly learning new wrinkles. The old saying that experience is a great teacher applies in tree lore as well as in many other lines of human endeavor.

William J. Butler is General Manager of the Board of Commissioners of West Park, Joliet, Illinois. A few years ago he read in the magazines that dynamite was great stuff to use in preparing holes in which to plant young trees. But he was a conscientious man and didn't feel it would be right to try out experimental ideas in the public park which was entrusted to his care, so he determined to test it in his own private orchard.

He ordered from a nursery some Early Richmond cherry trees, some Siberian Crabs and several other varieties of apples and decided to plant them in blasted soil.

But, realizing the need of sometihng to compare with, in order to see just what the advantages might be of the new method, he induced some of his neighbors to order some of the same stock from the same nursery and plant it at the same time, in soil of similar characteristics, in spade-dug holes.

Mr. Butler says the tree holes on his place were blasted with half sticks of dynamite. The neighbors dug their holes in the good old-fashioned way.

All the trees were two-year old nursery stock, and were set out three years ago last April.

Let Mr. Butler tell the results of the experiment in his own words. He says:

"My trees were actually twice as large and look healthier in every way. I had plenty of cherries and crab apples this season, also some other apples, while there was not the sign even of a blossom on the trees planted in the undynamited soil. Trees on both places have had practically the same care, so I am satisfied in my own mind that the difference in growth is due entirely to the different modes of planting.

"All I knew about dynamite as used in tree planting was what I had read in the magazines and I was merely experimenting when I planted my trees, but I want to say now that if I had forty orchards to plant, not a tree would be set out that was not in a dynamite hole."

Evidently, Joliet citizens, residing near West Park, may be expecting to be treated to a little display of fireworks the next time any trees are to be set out in the park. If Mr. Butler will do the planting on the Fourth of July, it will be unnecessary for the boys in that neighborhood to invest any money in firecrackers fittingly to celebrate the glorious day that typifies our independence.

PRODUCES AN ALL-AROUND WRENCH.

An all-around wrench that will prove handy in a "tight corner" is illustrated herewith. This wrench is manufactured by the Bemis and Call Hardware and Tool Company, Springfield, Massachusetts. In places where an ordinary monkey wrench would be a

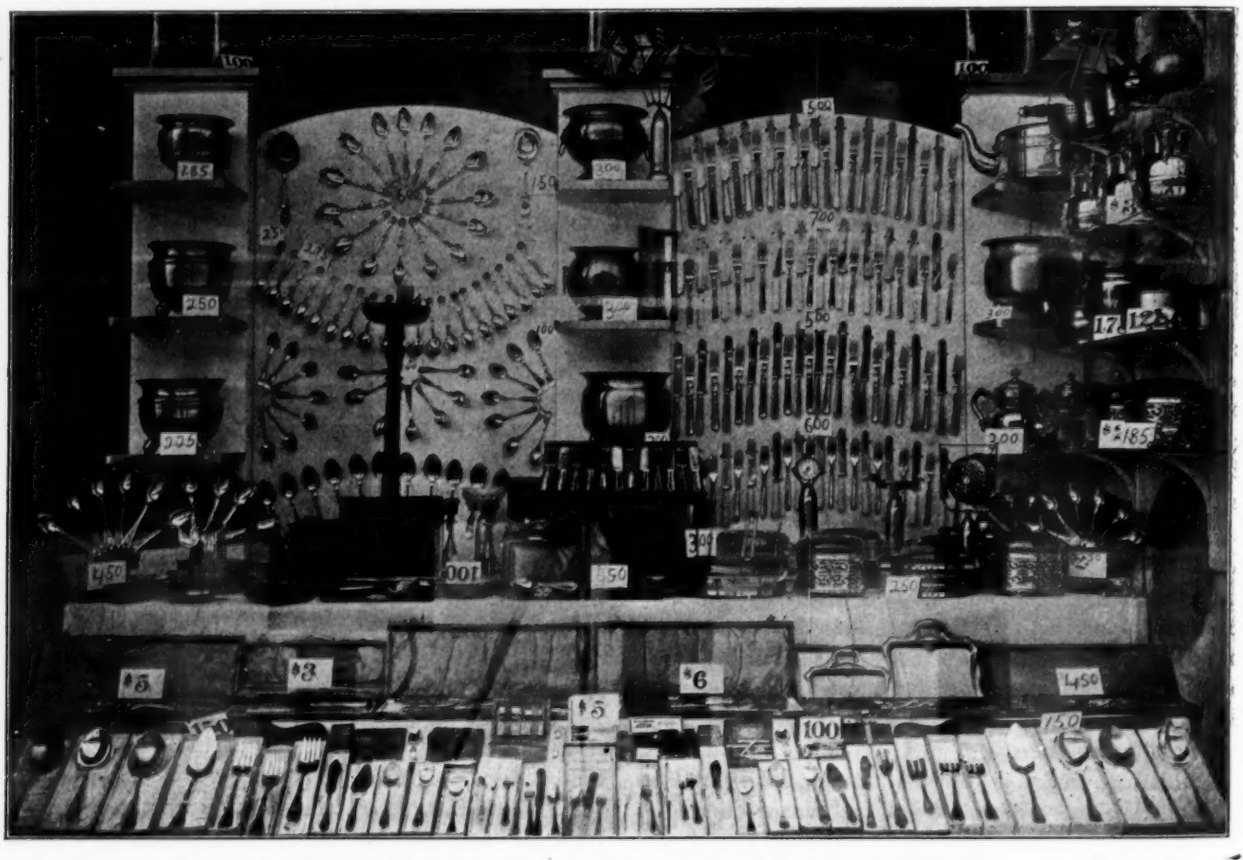
"B & C" Improved Adjustable "S" Nut Wrench, Made by the Bemis and Call Hardware and Tool Company, Springfield, Massachusetts.

hindrance rather than a help, the "B & C" Improved Adjustable "S" Nut Wrench would fill the need, declare the makers. Being sturdily made, this wrench will last an unusually long time. The metal used in its manufacture is of a high quality. It is carefully tempered. The sliding jaw on this wrench is provided with a full bearing on the frame when open to its widest capacity. Each part is equally strong. Having a neat appearance, the "B & C" Improved Adjustable "S" Nut Wrench is a tool that can be advantageously displayed. The Bemis and Call Hardware and Tool Company manufactures a varied assortment of wrenches besides the one depicted herewith. Wrenches for any sort of work can be obtained from this company. All are produced with the same care which characterizes the "B & C" Adjustable "S" Nut Wrench. A catalogue describing its line of wrenches will be sent upon inquiry to the Bemis and Call Hardware and Tool Company, Springfield, Massachusetts.

EXHIBITS IN AMERICAN ARTISAN WINDOW DISPLAY CONTEST

SILVER AND BRASS WARE ARE USED TO CONSTITUTE A GAINFUL WINDOW DISPLAY.

An impression of completeness is clearly conveyed by the window exhibit of silver and brass ware shown in the accompanying illustration. It was designed and arranged by J. C. Kayser, Simcoe, Ontario, Canada. Its merits are so positive that it was awarded honorable mention in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.



Window Display of Silver and Brass Ware Arranged by J. C. Kayser, Simcoe, Ontario, Canada, Awarded Honarable Mention in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

The articles constituting the exhibit were placed in such a manner as to produce the effect of brightness and carry suggestion of high polish and pleasing finish, which are undoubtedly features of silver and brass ware that make a strong selling appeal. It will be noted that practically all of the space was taken up with various goods of brass or silver ware.

Notwithstanding the compactness of the arrangement there is no hint of crowding together of articles. By reason of the fact that various commodities are grouped in their natural relationships the observer quickly perceives the exhibit as a collective unit rather than as a series of dissociated objects.

Optically, this window display is of a high order of excellence. The play of light and color is harmonious. The dominating white and gold of the setting serve to bring out with distinctness the glints of silver and brass without dazzling the eye.

The pleasing sheen of silver is the main motive for its use in the average home. It is true that the utilitarian motive is also active in the choice of silverware for the kitchen and table. That is to say, silverware is not subject to rapid deterioration from rust. But it is safe to say that the first thought which influences the purchaser derives from the artistic rather than the utilitarian motive.

This window display emphasizes the beauty of silverware and the attractiveness of glistening brass. It accomplishes this desirable effect by careful designing and intelligent selection of colors that give the right degree of contrast. Manifestly in commodities of this character, sharp differentiations are not required in a window display because the chief purpose it to present them in their entirety as necessary parts of a complete household equipment of silver and brass ware.

It seems scarcely necessary to add that the designer of this window exhibit spent a great deal of thought and time in its preparation. He took into account the methods by which the attention of the observer is most quickly arrested and most successfully held. He

gave full consideration to the lighting effects of articles that constitute the window exhibit and took especial pains to avoid a strong glare which would exaggerate the brilliance of the exhibit and detract from the general impression which he sought to produce. In this he was eminently successful.

Many large sales came from this window exhibit. The designer attributed this profitable result principally to the impression of completeness which the window display produced. One article suggested the need of the other throughout the contents of the exhibit. Thus large sales naturally followed rather than small haphazard purchases.

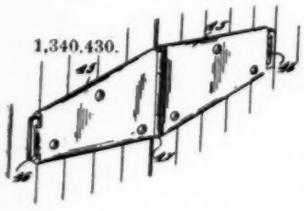
IS APPOINTED GENERAL MANAGER OF CORBIN SCREW CORPORATION.

A substantial reward of merit is the promotion of George P. Spear to the position of general manager of the Corbin Screw Corporation, New Britain, Connecticut. He succeeds Charles Glover who has been actively identified with the company for more than forty years.

Mr. Spear has reorganized the sales department of the Corbin Screw Corporation and has appointed Earnest E. Baldwin as general sales manager to succeed the late William E. Diehl.

PATENTS SECURITY SHEATH HINGE AND DOOR FASTENING.

Under number 1,340,430, United States patent rights have been granted to Frank Wright, Blairmore, Alberta, Canada, for a security sheath hinge and door fastening described as follows:



A device of the class described, comprising a tubular tapered member designed to be secured to a door and having a tongue, a hinge member slidably engaging the tubular member and provided with a slot, means for securing the tubular member to the door, the said means underlying the hinge member, the tongue being designed to be bent over and engage with the slot, as and for the purpose specified.

DEMAND FOR OLD-TIME POCKETKNIFE IS GRADUALLY DYING OUT.

The many-bladed pocket-knife of a generation ago —the joy of its youthful possessor and the inspiration of envy in the heart of every other boy in school —seems doomed, says the St. Louis Times. One by one the delights of its makeup and the intricacies of its service have been taken away by the changing life of the country.

A boy of today would scarcely recognize the pocketknife of his grandfather. It had blades large and small. It provided a minute pair of scissors for use on the finger nails and a file for finishing of the manicuring job. There was a hook for buttoning one's shoes, and another for removing stones from the hoof of a horse. There was a key-like device with which to wind a watch, and a stubby and sharply pointed awl. Last of all, there was a corkscrew whose very wickedness of purpose made the juvenile owner of the knife the proudest lad in the village.

But, alas, time's famed proneness to bring innovations has played havoc with the old-time pocketknife. The pride of the Nineteenth Century boy's heart has been robbed of about everything which made it worth bragging about. Scissors and files for the nails aren't popular pocket pieces now. Shoes are more frequently laced than buttoned, horses have almost gone out of fashion, watches are all stem-winding, there is no need of carrying around an awl—for what is there to punch? And as for the corkscrew—well, times have, indeed, changed.

Yes, the pocketknife of today is different. It usually contains two blades—one large and the other small. It must be a thin knife, in order not to take up space nor wear out the apparel. Think of that—when the boy of 40 years ago got bliss for merely directing attention to the bulge of his leg which marked the presence of that wonderful Barlow within his trousers pocket!

REGISTERS TRADE-MARK FOR RAZORS.

United States Patent Office registration under number 127,850, has been granted to the Boker Cutlery and Hardware Company, Incorporated, New York City, for the trade-mark shown in the illustration herewith. The particular description of goods to which this trade-mark applies is razors. The Company claims use of this trade-mark since about the 1st of November, 1902. The application for this trade-mark was filed February 2, 1920.

RED-INJUN
127,850.

BETTER BUSINESS BUREAU ISSUES ADVICE TO ADVERTISERS.

The decidedly constructive character of the work of the Better Business Bureaus (local vigilance committees) of the Associated Advertising Clubs of the the World is strikingly illustrated, says a bulletin from the headquarters of the advertising association, in New York City, by some recommendations to advertisers issued by the Better Business Commission of Cleveland, which is affiliated with the Associated Advertising Clubs.

This matter, which has been sent to all advertisers in Cleveland, has been prepared out of the experience of the best stores in that city, it is announced, and on the title page is the following: "Recommendations offered as a guide to advertisers to assist them in avoiding advertising statements and practices that have a tendency to reduce consumers' confidence in all advertising."

The text of the recommendation is as follows:

1. It is recommended that care be taken to substantiate definitely any fact or assertion made in an advertisement prior to the time the advertisement comes before the public.

Unintentional misrepresentations cause just as much criticism as intentional ones and the reader does not stop to consider that it may have been unintentional. The result being that the advertiser is criticised to an unjust extent and ensuing advertisements do not inspire the confidence they might deserve.

The wrong impression can be derived from an advertisement in which there is statement of one fact which is not well grounded.

2. It is recommended that the use of superlative statements be refrained from unless the advertiser can, and will, submit proof of such statements to the Better Business Commission if requested.

The force of superlatives in advertising has been considerably weakened through misuse. The public has a right to take superlative statements literally. The advertiser has a right to expect them to be taken literally when he has proof to substantiate them.

The repeated use of superlative statements which can not be substantiated, whether made by the same or different advertisers, destroys the confidence of the public in superlative statements which may be 100 per cent truthful.

3. It is recommended that where comparative prices are being quoted, values be based on the average quotations for the same class of merchandise in other stores in the city.

The public determines value in this way and a statement of value means to the reader the average value as found in other stores.

4. It is recommended where comparative prices are being quoted that a definite distinction be made between "early season" values and "current" values based on the average quotation for the same class of merchandise in other stores in the city.

The wrong impression is created in the mind of the public when former or "early season" values are referred to and the reader interprets the statement to mean "current" values.

5. It is recommended where comparative prices are being quoted that when merchandise of different values has been grouped for sale at one price, the advertisement states the minimum value in the group as well as the maximum value.

The reader generally gets the wrong impression of the entire lot of merchandise when the highest values in the group are quoted and the advertisement does not state the lowest values. Where the lowest as well as the highest values are quoted the reader gets a better impression of the group and will not be subject to disappointment.

Greater confidence in the advertiser is inspired when the complete price range is clearly stated.

6. It is recommended where comparative prices are being quoted and merchandise of different values has been grouped together for sale at one price that each article bear a ticket indicating to which of the advertised values that article belongs.

The public should have no difficulty in ascertaining which articles of merchandise are of the various values stated in the advertisement.

7. It is recommended that extreme care be taken in advertising to avoid making statements which might be misconstrued.

Statements which can be misconstrued cause criticism of the advertiser to an extent which may be unjust.

Equivocal statements destroy confidence and invite suspicion.

8. It is recommended that when merchandise is being advertised which is soiled, of second quality, or for any reason whatever not perfect in every respect from the standpoint of the manufacturer, the advertisement state clearly and explicitly the facts as they are.

Unless such facts are clearly stated customers are disappointed when they come to the store in response to the advertisement, and confidence in advertising is lessened.

Not to state such facts clearly is judged by the Federal Trade Commission to be a violation of Special Provisions to Regulate Interstate Commerce.

9. It is recommended that when merchandise is being advertised which is an imitation of merchandise of higher quality or value, great care be taken that the advertisement does not convey the impression that the merchandise is the genuine quality.

There is danger of misrepresentation to the extent of fraud.

Even if from the sale price quoted it is obvious that the merchandise is not genuine, or even if the advertiser is under the impression that the public is informed generally that such merchandise is imitation, greater confidence is inspired in the advertising if care is taken to point out the facts clearly.

TRADE-MARK FOR SHEARS AND SCISSORS IS REGISTERED.

United States Patent Office registration, under number 129,162 has been granted to the Acme Shear Company, of Bridgeport, Connecticut, for the trade-mark shown in the illustration herewith. The particular description of goods to which this trade-mark applies is scissors and shears. The Company claims use of this trade-mark since on or about February 19, 1920. The application for this trade-mark was filed March 3, 1920.

ADVERTISING IS PROFIT INSURANCE.

Advertising is a fine art, and is being conducted on a scale so vast that there is virtually no business of private or public interest which is not comprehended under its activities. The time is gone when the man who seells this form of inter-communication must defend it or prove its value. Also the time is gone forever when the man who thinks the old-time "exclusive" story is possible can conduct such a store and survive. Nowadays entire industries combine to advertise. It is not a question whether advertising should be done, but where it should be placed. It is, in fact, profit insurance.

Somehow a man's neighbors never realize what a good man he was until they hear the minister tell about it at the funeral.

GETS TRADE-MARK REGISTERED.

The Haynes Stellite Company, Kokomo, Indiana, has obtained United States Patent Office registration, under number 116,051, for the trade-mark shown in the accompanying illustration. The particular description of goods to which it is applied is blades and cutters for milling, turning, and the like metal-working machinery. The application for registration was filed February 21, 1919. Use of this trade-mark is claimed by the Company since about November, 1915.

PRESENTED BY BUREAU OF FOREIGN AND DOMESTIC COMMERCE.

The Bureau of Foreign and Domestic Commerce, through its Special Agents, Consular Officers and Commercial Attachés, is receiving information of opportunities to sell hardware and kindred lines in several foreign countries. Names and locations will be supplied on request to the Bureau in Washington or its District Offices. Such requests should be made on separate sheets for each opportunity, stating the number as given herewith:

32949.—A commercial agent in Italy desires to secure an agency for the sale of agricultural implements, iron and steel products, etc. Correspondence should be in Italian. Reference.

32953.—A cooperative association in Argentina desires to secure agencies for the sale of farm implements and machinery, oils, tools, etc. Payment will be made on arrival of goods in Argentina. Correspondence should be in Spanish. Reference.

32954.—A company in New Zealand desires to secure agencies for the sale of hand separator, windmills, pumps, farming implements and automobile accessories. Quotations should be given c. i. f. Timaru or Wellington. Reference.

32958.—A manufacturer in Belgium desires to secure an agency with stock of goods for the sale of files, bolts, screws, rivets, cotters, vise, anvils, ventilators, etc. Correspondence and catalogues should be in French.

32974.—A firm of manufacturers' agents in India desires to be placed in communication with manufacturers and exporters with a view to securing agencies for the sale of goods in that country. Quotations should be given c. i. f. Indian port. Terms of payment to be by 30, 60, or 90 days' drafts, documents against payment. Samples are requested. References.

32980.—A firm of manufacturers and wholesale warehousemen in England desire to secure the sole buying agency for own account, for hardware, and any other lines, subject to deliveries in large quantities only. Quotations should be given c. i. f. English port. Credit terms, three months' bills from date of arrival of goods. Reference.

32985.—A partner of a trading company in India is in the United States and desires to secure an agency and purchase for the sale in India of wire nails, hardware and low-priced automobiles. Quotations should be given f. o. b. New York. References.

32988.—A trading company in England desires to secure sole agencies, and to purchase outright any American specialties, novelties, etc. Quotations should be given f. o. b. New York. Payment will be made against documents. Reference.

32989.—A firm in Bulgaria desires to purchase and secure an agency for agricultural implements and farm equipment. Correspondence should be in Bulgarian or French. Reference.

32990.—An industrial organization in the Caucasus desires to purchase and secure agencies for motor-car accessories. Quotations should be given c. i. f. Batum. Payment will be made through firm in New York City. Correspondence may be in English. Reference.

32969.—The commercial adviser to a firm in Hungary wishes to secure the representation of firms for the sale of American goods in that country. Correspondence may be in English. References.

32992.—A firm of importers in Australia desires to secure an agency for the sale of wire, tin plate, galvanized and other heavy hardware. References.

32993.—The representative of a firm in Norway is in the United States for the purpose of making arrangements with manufacturers of automobile accessories for their sale in his country. Reference.

32995.—A commercial agent in Italy desires to secure an agency for the sale of motor-car accessories. Correspondence should be in French or Italian. References.

33000.—A merchant firm in Bulgaria desires to purchase and secure an agency for hardware, hoes, shovels, forks, steel, nails, sheet iron, white tin, pewter, pails, etc. Quotations should be given c. i. f. Varna. Cash will be paid. Correspondence should be in German. References.

COMING CONVENTIONS.

National Retail Hardware Association, Lafayette Hotel, Buffalo, New York, June 22, 23, 24, and 25, 1920. Herbert P. Sheets, Secretary, Argos, Indiana.

Texas Hardware Jobbers' Association, Waco, Texas, July 9 and 10, 1920. R. F. Bell, Secretary-Treasurer, 320 Broadway, New York City.

Mississippi Retail Hardware and Implement Association, Agricultural College, Mississippi, July 13, 14 and 15, 1920. E. R. Gross, Secretary-Treasurer, Agricultural College, Mississippi.

Ohio State Sheet Contractors' Association, Toledo, Ohio, July 20, 21, and 22, 1920. W. J. Kaiser, Secretary, Columbus, Ohio.

Kentucky Hardware and Implement Dealers' Association, Louisville, Kentucky, January 25, 26, 27 and 28, 1921. J. M. Stone, Secretary, Sturgis, Kentucky.

Wisconsin Retail Hardware Association, Milwaukee, Wisconsin, February 2, 3 and 4, 1921. P. J. Jacobs, Secretary, Stevens Point, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association, Incorporated, Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, February 8, 9, 10, 11, 1921. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh.

Illinois Retail Hardware Association, Hotel Sherman, Chicago, Illinois, February 15, 16 and 17, 1921. Leon D. Nish, Secretary, Elgin, Illinois.

RETAIL HARDWARE DOINGS.

Indiana.

Fairmount Hardware Company of Fairmount has been incorporated with a capital of $12,000. Directors are Morton Buller, Jasper A. Friend, Ozro G. Frankboner.

Kansas.

Milberger Cooperative Union, general hardware and implement store of Milberger, Post Office Russell, has been incorporated with a capital of $10,000. Incorporators are William Michaelis and others.

S. E. Baer is having a closing out sale of hardware and other stock at Scott City.

J. A. Lockstrom and Oscar Hederstedt have bought the hardware store at 106 North Fifth Street formerly owned by G. B. Meyers of Salina.

Minnesota.

G. C. Persons has sold his hardware store at Grey Eagle to a Mr. Cole.

Missouri.

Carr Hardware Company has been incorporated at Kansas City with a capital of $5,000. Incorporators are S. C. Carr, M. A. Carr, C. S. Lockridge.

North Dakota.

The Henning Hardware Company will erect a new building at Hillsboro.

Oklahoma.

Dr. Waters has purchased the J. N. Goff building occupied by Hrabe hardware store at Pawnee.

Coalgate Furniture and Hardware Company have succeeded the Jackson-Varner Hardware Company at Coalgate. I. Ingelberg is manager.

Texas.

Jennings Hardware Company, Incorporated, has been chartered with a capital of $15,000 at Dallas by L. A. Jennings, L. E. Hatley, and T. L. Dooley.

Henry Pentecost has purchased an interest in the Eastland Hardware Company of Eastland. The company is capitalized at $120,000. Tom Harrell is president.

Hons-McNulty Hardware Company has sold its stock of hardware at San Marcos.

Citizens' Hardware Company has increased its capital stock at North Fort Worth from $9,000 to $14,000.

Wisconsin.

The Cambridge Hardware Company have begun work on their new store at Cambridge.

Ed Yohanek is enlarging his hardware store at Kellnersville.

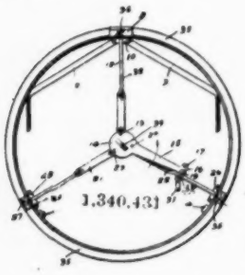
C. G. Schmidt has sold his hardware business at West Allis to Edward Pickert and Nicholas Freund.

AUTOMOTIVE ACCESSORIES SOLD BY HARDWARE DEALERS

The Brunner Manufacturing Company is enlarging its plant for the manufacture of automobile pumps at Utica, New York.

GETS PATENT FOR A TIRE CARRIER.

Under number 1,340,431, United States patent rights have been procured by Paul Barnum, San Francisco, California, for a tire carrier, described as follows:



In a tire carrier, the combination of a ring, supports for said ring, said supports being attached to a car, a laterally projecting member near the top of said ring, the outer end of said lateral member being supported by said supports, hinged lateral members substantially one hundred and twenty degrees removed from said upper lateral member, a circular member equidistant from said lateral members, links pivoted to said lateral members and to said circular member, said links being bent substantially midway of their length, a handle integral with said circular member, said handle having a T-shaped head adapted to engage openings in either of two said links, a stop carried by said T-head, and means for locking said handle in a fixed position.

GIVES POINTERS ON TRACTOR OIL.

Those tractors using water injection into the explosion chamber should use a compounded oil, that is, a mineral oil mixed with a percentage of animal fat, to obtain best results. The reason for using water injection into the explosion chambers in some of the larger tractors is that they use instead of refined fuel, plain crude oil or distillate. This does not burn up cleanly in the explosion chambers and leaves deposits resembling that of heavy lamp black. To remove these deposits water is injected in the form of steam or vapor into the explosion chambers, forming carbon monoxide, which eliminates these deposits, but on account of this injection of water it is liable to leave dry spots on the cylinder walls, and therefore a fatty oil is added to the lubricating oil to prevent these dry spots.

It is necessary when selecting an oil to consider price secondary, quality always first. The farmer will more than make up the difference between "ordinary oil" and correct lubrication in money, worry and time and his tractor will be in service long after his neighbor's has seen its grave.

KNOWLEDGE OF AUTOMOTIVE MATTERS HELPS PROMOTE SALES.

One of the most important points in connection with the operation of a department of automobile supplies is that the person in charge and the sales people must have a reasonably wide knowledge of the various automobiles and be able to talk intelligently on the workings of the different "makes." This doesn't mean, however, that these men should be able to take a car apart and build it up again, but simply that they must be posted on the novelties in attachments and the new models that are having the call.

This, after all, is, of course, nothing more than the kind of knowledge that is required of the salesman or the head of any other department of the store, and with some careful, painstaking study this knowledge will soon be acquired, as there are all sorts of fine booklets and catalogs published by manufacturers of automobiles as well as by those who specialize on "supplies" or "extras."

GET BENEFITS OF ADVERTISING.

If you are one of the accessory dealers who have had the feeling that the manufacturer was advertising because he liked to see his name in print or because he was making more money than he knew how to spend some other way—wake up.

Big advertising is done because it is the most effective and most economical method of creating a demand for the dealer to cash in on. Any dealer can do it if he will. A trial invariably convinces the most skeptical dealer if he makes his trial a fair one.

Some dealers think so much of the value of the assistance that national advertising can be to them that they write to the manufacturers of the lines they handle and ask for the dates of the special publicity drives that the manufacturers are making. Then they practically sign their own names to the manufacturers' advertisements by timing their sales efforts to correspond.

WANTS MAN WHO LOVES TO WORK.

Every employer is always looking for men who really love to work. Yet work alone is not enough to make a man truly successful. Thousands of men can echo that, some of them very bitterly. They have worked, they say, but have not reached any real height of success. Unorganized work, work performed without an eye fixed on the ultimate goal, is generally futile. A writer has said that a man of ordinary mind, body, and attainments, if inspired by some high ideal, accomplishes far more in life than the man of the finest mental and physical equipment who drifts.

ADVERTISING CRITICISM AND COMMENT

Helpful Hints for the Advertisement Writer

With the increasing average intelligence general statements have more meaning to the reader of an advertisement than they formerly conveyed. That this is true is shown by the growing number of schools and the increasing number of publications. Ten years ago the advertisement of the McCutcheon Hardware Company, Greeley, Colorado, reproduced herewith from *The Tribune - Republican*, Greeley, Colorado, would not have met the response which was given it when it appeared in that newspaper. This advertisement which measures 4 inches and is one column wide contains but one sentence. Its meaning, however, is clear. Also, it is assured that more people read this advertisement because of its brevity than would be the case were it cumbered with closely set reading matter. Yet in a thorough analysis this suggestion is pressingly brought to the fore. A more specific mention of the building hardware referred to would be advisable. But opinions differ.

BUILDING HARDWARE

That Stands the Test at the

McCUTCHEON Hardware Co.

* * *

To make a statement like the one appearing on the advertisement of the Freyman Tool Company, 309 Prospect Avenue, Cleveland, Ohio, which is reproduced in the accompanying illustration from the *Cleveland Press*, is to invite the attention of all who seek to economize in the purchase of hardware. Substantiation is added to the initial statement by the setting down of prices accompanied by a description of the tool to which they apply. The man who purchases tools regularly will immediately be able to determine whether the prices set forth are comparatively cheap. If they are, this advertisement gains its end. Yet there is another factor to consider. That is quality. The price may be low. But if the quality is not in accordance with the standard required by the average purchaser, the reduction of price will not avail. However, to comment on the mechanical proportioning of this advertisement, it can be said plainly that it is good. The formation is neat and attractive. Each important item and statement is prominently displayed. The name of the advertiser in large type is a detail of good form. In this instance it is necessary to portray with unusual clearness the source of the bargains.

Freyman Sells Better Tools for Less Money
"BIG 4" SPECIALS
Claw Hammer made of good drop forged steel. special this week at ..... 88¢
Coping Saws come with 12 blades. This week they are, complete ..... 23¢
25 Foot Ass Skin Tape ..... 43¢
7 Inch Comb. Oil Stone ..... 19¢
FREYMAN TOOL CO. 309 PROSPECT

* * *

Frequently, it happens that an advertiser can not afford to use a great amount of display space wherein to feature some commodity which he handles. He is, therefore, confronted with the problem of presenting his message to prospective customers as eloquently as possible within the circumscribed limits of the space he feels able to purchase in the newspaper. It is the experience of many successful men of business that by devoting much care to the preparation of small advertisements they are gradually enabled to take larger space as a result of the steadily growing orders received from carefully prepared copy in the limited space at their disposal in the beginning. The advertisement of W. H. Spillers and Son, Wichita, Kansas, reproduced herewith from the *Wichita Beacon*, Wichita, Kansas, is a good example of this phase of publicity. The illustration is adequate and the wording is chosen with a view to saying the most in favor of the product without overcrowding the advertisement. In spite of the small amount of space used there is a sufficient allowance of white in the advertisement to afford the necessary contrast to attract the eye of the reader.

One good, hearty laugh is a bombshell exploding in the right place, while spleen and discontent are a gun that kicks over the man who shoots it off.—*T. DeWitt Talmage.*

HEATING AND VENTILATING

NEW HEATING SUPPLY COMPANY IS FORMED IN CHICAGO.

Considerable interest has been aroused in the furnace trade by the announcement of the formation of a new supply house under the name of the Manny Heating Supply Company, 131 West Lake Street, Chicago, Illinois. The president of the newly created company, J. Harvey Manny, is widely and favorably known to the trade. He extends a cordial invitation to furnace dealers and installers to call upon him whenever they chance to be in Chicago and to inspect his company's line of furnaces and supplies. The Manny Heating Supply Company carries a complete assortment of furnace pipe and fittings, registers, furnaces, asbestos paper, paste, cement, sheet metal, screws, dampers, and all other furnace accessories. The company assures prospective customers that prompt service will be a policy faithfully adhered to in all its dealings with them.

OBTAINS SPLENDID RESULTS FROM AD IN AMERICAN ARTISAN.

To American Artisan and Hardware Record:

Please discontinue our ad in Classified Department. It has given splendid results and we wish to thank you for your courteous policy toward your subscribers.

Respectfully,

Jacobson and Bogue.

Beresford, South Dakota, June 1, 1920.

DISCUSSES NEW THEORIES OF THE RELATIONS OF PHYSIOLOGY TO VENTILATION.

(*Concluded from last week.*)

When any additional muscular movement or other expenditure of energy is initiated in the body the oxidation of a certain proportionate additional quantity of the carbon and hydrogen in the food substances already absorbed is automatically produced.

Only a small proportion, some 20 per cent, is utilized in the form of work. The remainder is converted into heat, thus the amount of heat produced is in general proportion to the amount of oxidization. There is more heat produced by the body in cold than in warm surroundings. Also there is much more heat produced in a body at work than at rest. These are the outstanding facts to remember in connection with *the generation* of heat.

In order to illustrate the magnitude of the figures concerned, Table No. I is given, which shows the amount of heat liberated by a man in different conditions of work, on the authority of the physiologists Douglas and Haldane. The work in this case consisted in walking at particular speeds. The man on whom these experiments were made weighed 140 pounds, and had a surface of about 20.9 square feet. The table shows the total heat liberated, the same quantity calculated per square foot of body surface, and the amount of air breathed and CO_2 emitted.

During every day the condition of every human being varies from complete rest to very strenuous activity. There is a certain minimum amount of heat necessarily produced in the body even when at perfect rest, owing to the ordinary internal "metabolism" inseparable from life itself.

This figure may be taken to be approximately the same as the total emission when the man is asleep, in this case 275 B.T.U. per hour.

Table I.
Co_2 and Heat Produced per Hour.

	Air breathed. Cubic feet per hour.	CO_2 given off Cubic feet per hour.	Heat produced B.T.U. per hour	B.T.U. per square foot of skin surface per hour
Resting in bed	16.4	.417	275	13.1
Standing at rest	22.2	.588	375	17.9
Walking 2 miles per hour	39.6	1.40	905	43.2
" 3 " " "	53	1.95	1300	62.1
" 4 " " "	79.5	2.96	1870	89.5
" 4½ " " "	99	3.80	2350	112
" 5 " " "	129	5.05	3030	144

It is important also to know what is the total heat given off through an ordinary period of 24 hours. This is given in Table No. II. for a man engaged in sedentary occupation. In all it is about equal to the heat in 10 gallons of very hot water.

Table II.
Heat Loss in 24 Hours.

	Period. Hours.	B.T.U. per Hour	Total
Sleeping	8	277	2220
Resting	6	370	2220
Working (72,500 ft. lb. per hour)	10	868	8682
Total	24	B.T.U.	13122

A constant temperature in a mass of matter living or dead can only be obtained when the heat it gains is balanced exactly by the heat it loses. As there is here not only a variable environment but also a variable internal source which supplies heat at different rates according to the temperature of the surroundings and muscular activity of the body, then it is obvious that if the temperature is to remain constant, the body must also be supplied with a very variable means of getting rid of that heat.

It is thus evident that if the body is to be kept at a constant temperature whether working or at rest, whether in cold or warm surroundings, not only must any surplus heat be somehow or other got rid of when in warm surroundings, but either a greater amount of heat must be generated or any

undue loss must be prevented when in cold surroundings, or both. There must be some extremely efficient means for regulating by accelerating or retarding not only the production but also the emission of heat, according not only to the interior conditions of the body, but of the exterior or surrounding conditions of the environment.

The mechanism by which this double compound regulation is effected in the body is probably one of the most extraordinarily efficient series of devices to be found in the whole of nature. As this mechanism is very directly germane to the problem of heating, it should be studied by anyone wishing to understand the matter.

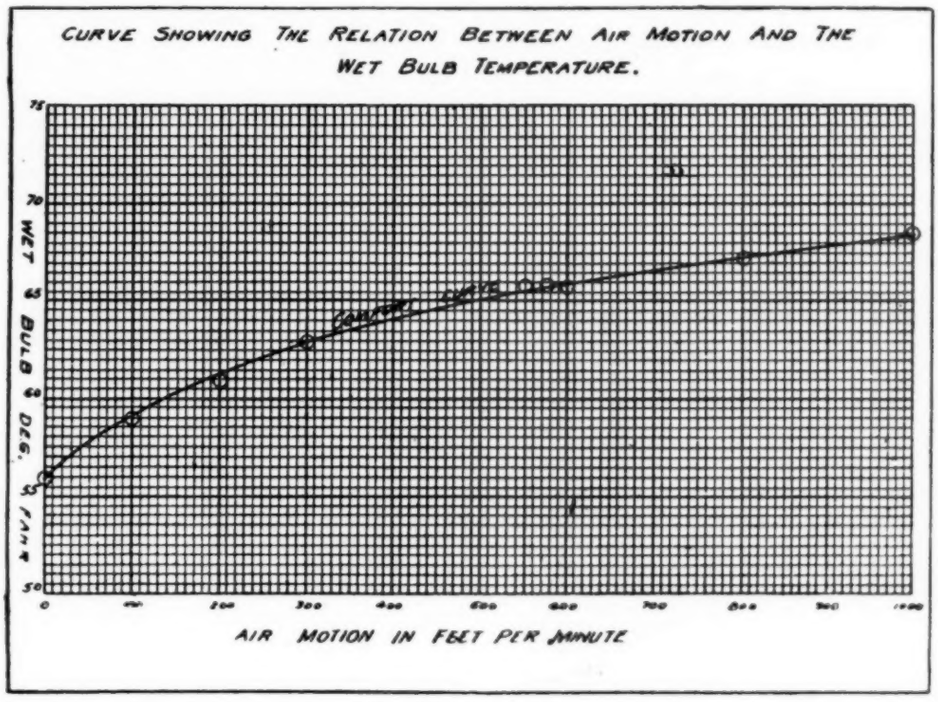

CURVE SHOWING THE RELATION BETWEEN AIR MOTION AND THE WET BULB TEMPERATURE.
WET BULB DEG. FAHR.
AIR MOTION IN FEET PER MINUTE

FIG. 6.

Figure 6. Curve of Relation Between Air Motion and the Wet Bulb Thermometer.

Heat is lost from the body in five principal ways:

(1) By the rejection of the waste products of the body.
(2) By the expired air.
(3) By evaporation from the lungs.
(4) By evaporation from the skin.
(5) By conduction and radiation from the warm body surface.

For the purpose of giving some idea of the relative importance of these means for evacuating the surplus heat, Table No. III. is given, showing the amount of heat lost in normal circumstances from the human body by all these various means throughout a normal period of 24 hours.

TABLE No. III.

Showing how heat is lost from the body in ordinary sedentary conditions.

	B.T.U. in 24 hrs.	Per Cent	Average B.T.U. per hr.
(1) By urine and feces	190	7.9	1.9
(2) By expired air	360	15.0	3.6
(3) By evaporation from lungs	750	31.3	7.5
(4) Evaporation from skin	1450	60.5	14.5
(5) Conduction and radiation	7250	305.3	72.5
	10,000	420.0	100.0

It will be seen that we can disregard the first of these means of heat loss as insignificant in magnitude. The second and third are also relatively unimportant. The fourth and fifth are evidently the means whereby the greatest portion of the heat is dissipated, although the second and third also take their share in the regulation.

Let us now consider how Nature controls each of these five modes of heat loss. Suppose that the body is in the normal condition of semi-inactivity, and in this condition all the five causes of loss altogether cause total emission from the body of 400 B.T.U. per hour. When in this condition let it be supposed that the person concerned commences some form of energetic muscular activity. The first effect is that the food substances previously stored by the blood in the muscles begin to be oxidized at an increased rate owing to the muscular movement. What is the precise mechanism which causes this oxidation is not fully understood. The effects, however, are quite apparent, and can be demonstrated. These are principally:

(1) An increased secretion of carbon dioxide dissolved in the blood.
(3) An increased evolution of heat (see Table I).

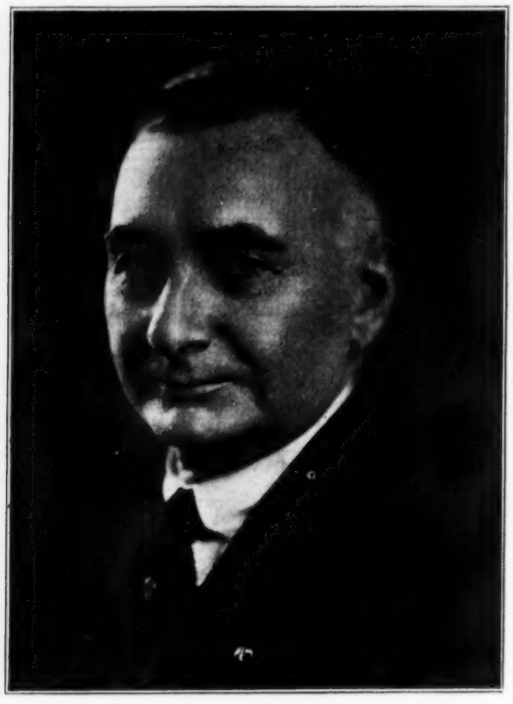
The effect of the carbon dioxide in the blood is to stimulate the activity of the breathing centres. The man breathes more frequently and more deeply. The effect is that a greater quantity of carbon dioxide passes from the blood into the air of the lungs, and is breathed out and eliminated. The temperature of the air expired and the quantity of moisture in it increase at the same time. There is, therefore, a considerable additional heat emission due to accelerated breathing.

(To be continued.)

Even a deadbeat is always willing to pay an old grudge.

Meeting of Western Warm Air Furnace and Supply Association Is Tonic and Instructive.

There need be no fear of the future of the warm air heating industry so long as men sincerely concern themselves with high standards of production and service. The members of the Western Warm Air Furnace and Supply Association, who met June 8, 1920, in Peoria, Illinois, are imbued with a sense of responsibility which augurs well for the progress of the trade. They are men of broad vision. They do not allow their perspective to be obscured by personal interests to such an extent as to make the common good a secondary consideration. Sentimentalists are as rare in their ranks as stenographers at a convention of Esquimaux seal hunters. They are not swayed in matter of business by emotion. Yet sentiments of courtesy, friendliness, and good fellowship are uppermost always in their meetings. There is no lost motion when they foregather. They know that time nowadays is too precious to be wasted in preliminary formalities. Therefore, they contrive to use every moment of their gatherings to the best advantage. Thus, in the Peoria meeting, which lasted only one day, the Association succeeded in covering many subjects which ordinarily required two or three days of discussion. The meeting was tonic and the addresses instructive.



Fred L. Nesbit, President Western Warm Air Furnace and Supply Association.

President Fred L. Nesbit briefly reviewed the prevailing factors in the warm air furnace and supply field and emphasized the necessity for clear thinking and earnest effort in dealing with the problems which affect the interests of the membership.

The first address on the program was by R. W. Menk, of the Excelsior Steel Furnace Company, Chicago, Illinois. He pointed out the profound differences between the present day state of the furnace industry and the early days when manufacturers were not interested in the subject of economy and efficiency. The full text of his address is herewith appended:

Address on "The Warm Air Furnace of the Future," by R. W. Menk, Manager Furnace Department The Excelsior Steel Furnace Company, Chicago, Delivered to the Meeting of the Western Warm Air Furnace and Supply Association, June 8, 1920, in Peoria, Illinois.

To speak of the future without at least some reference to the past would be to ignore all that has paved the way to our present state of civilization.

In early days manufacturers were not interested in the subject of economy. Things were too new. Industrial development was too rapid. Competition was not intense. Resources seemed inexhaustible. We stupidly blundered on while all around us waste of every description held royal carnival. The soil was half cultivated and less than half cared for. Our great forests of splendid pine were ruthlessly destroyed. The sky was read with flaming gas wells in Indiana and Ohio.

No one seemed to think that our rich soil would ever become impoverished, that the time might arrive when we could not live in wooden houses because there would be no suitable wood with which to build them, and that our great stores of natural gas would ever become exhausted. We went blindly forward from year to year wasting enough to feed and clothe one-half of Europe. The time has come to pay the piper and it is a mighty long bill that the gentleman is presenting.

I have referred to the general trend of the present efficiency movement because of its compelling importance, and in order that what is to follow may gain some emphasis.

The past has done its part. The work and the effort have all been necessary. Each generation has contributed its part to the development of our existence, and this is also true of the warm air furnace.

The increase in the efficiency of the house heating in the last twenty-five years has not kept pace with many other lines. We have added a few features here and there, but no very radical changes have been introduced. This is not so in the power world. There are systems today wherein you may take a power boiler of standard construction and develop 200 or 300 per cent above its normal rating.

Furnace Progress Is Very Slow.

A veteran furnace manufacturer stated some time ago that there had been a woeful lack of progress exhibited by furnace manufacturers during the past forty years. A reason for this may be found in the ease with which it has been possible to market year after year the same type of heater with which the trade has been familiar for decades and which has rendered in most cases satisfaction to the user simply because of his lack of knowledge of what a heater should do. What was satisfactory a few years ago in the matter of fuel consumption will no longer fill the bill. With the cost of living mounting constantly the time is at hand when the house owner will demand of the dealer a guaranty of the number of tons of coal to be burned by the apparatus which he proposes to install and the dealer will demand of the maker a bond covering the performance of the heater which the dealer is handling.

This will bring about a decided change in the manner of conducting the warm air furnace business as well as cause greater attention to building construction. It will no longer be possible for the manufacturer to melt a given quantity of pig iron into the furnaces and sell them at so many cents per pound without reference to the distribution of the metal or the results to be obtained therefrom. He will have to get down to brass tacks and know just what his apparatus will do and stand back of it. He can not take the formulas of others which may have been worked out by theorists who have made money from the foundry end of the business and who have had no practical experience in the installation of furnaces or whose experience with the same has been confined to a small section of the country.

Salesmen Should Be Practical Furnace Men.

It has been the custom on the part of furnace manufacturers to market their product through the dealer using salesmen in locating agencies. In but few instances are these salesmen practical furnace men. In many cases they are stove salesmen, whose employers have added a furnace to their line, and agencies are established on account of the reputation of the stove end of the business. Very naturally the results have not been satisfactory to dealer or user in a majority of installations, and the furnace industry has suffered in consequence.

Many furnaces in the past have fairly good results and previous to the recent large advances in the price of fuel the difference of a ton or two of coal did not materially affect the average consumer provided he kept his house warm. But with the present high fuel prices greater attention must be given towards conservation.

The most imperative improvement is in the installation end and the quicker we can obtain action the better.

Chief Objections Are Dirt and Smoke.

Ask any owner of a warm air furnace (particularly a woman what is the chief objection to the same and the answer will be the dirt and smoke. What will be the next objection? That certain rooms can not be heated satisfactorily on windy days and that the drafts on the floors are too cold. Another objection, and a serious one, too, is that the air is too dry. Does that not about cover every kick? And isn't it about time that these conditions were corrected?

In alluding to installations of this character, I do not want you to get the impression that there are no good installations, there are thousands of them, and I believe the average installer does better work today than ever before. But I do think the manufacturer or jobber is greatly in error who sells his furnaces to anyone, regardless of his ability to install them. The matter of installation is a vital question and methods and ideas are still so varied that with all that has been said and done we are still very far apart.

Big Problem Is Fuel Cost.

So much for the past, but what of the future? Greater progress will positively have to be made. This is true of all methods of heating. The day of cheap fuel is past and a day is dawning when we will not only be more careful how and into what we throw our black diamonds, but the day is near when the cheap or carelessly installed furnace will go to the discard.

A day will come when you can not afford to supply a pound more iron or steel than is needed to secure efficient results. With pig iron selling at the fifty dollar mark, it is a crime against conservation to be wasteful of that article. There are heating engineers who are constantly studying the problem of obtaining better and better results in the burning of the cheaper grades of fuel and the number of these engineers engaged in this task should be trebled. The laws of heating are such that if failure results in any installation the violation of correct heating principles should be easily determined and corrected.

With hard coal selling at fifteen dollars per ton in cities like Chicago, and with bituminous coal commanding a price more than double that of the past, the heating engineer is brought face to face with the problem of designing heating apparatus which will reduce materially the consumption of fuel and in addition secure the installation of heaters in such manner as to deliver the largest possible proportion of heat units to the rooms to be heated.

Fundamental Considerations of Design.

In designing the future furnace there are many fundamental considerations. First the kinds of fuel and their various combustive abilities; second, the ratio between grate and heating surfaces; third, the heating surfaces—their thickness, shape, design and location; and lastly, the travel of the air between the casings and the furnace itself.

We have long realized the necessity of better combustion of fuels. What will be developed in the future is at this time pretty much a problem. The possibilities are so great that the more we study the question the more we realize the crudeness of our methods. The combustion of each kind of fuel is a problem in itself, and to design a heating apparatus for each is perhaps out of the question at this time. Perhaps it will interest you to know at this time that there is a new system known as "surface combustion and flameless heat." This new process is applicable to all kinds of gaseous or vaporized fuels. The temperatures attained are not only very much higher but the fuel consumed is only about one half that required in similar furnaces fired in the ordinary way by flame contact. It is our judgment, however, that it will require many years before same will come into common practice. The process of combustion in the ordinary heating furnace today does not meet the conditions required. The ordinary round pot can not dvelop the maximum of combustion. Consider for a moment that a fire is started with a clear grate and that every condition as to draft, air supply and depth of fuel bed is ideal. This condition can not last long, for the burning of a few pounds of coal will immediately change the air supply or the sudden raising of the velocity of the wind will upset the combustion. The line between poor and perfect combustion is very thin, and one has only to consider what happens to a gas lighting mantle when the pressure of the gas supply is changed. If the pressure rises excess air is supplied causing a reduction in light. If the pressure falls the lack of air causes the gases to condense and consequently, the mantle becomes coated with soot or carbon and this same condition exists when burning coal. We, of course, realize the necessity of excess air above the fuel bed when burning soft coal, especially, but this excess of air is a detriment after a certain stage in the fuel bed has been reached. Many fuels swell during the coking progress, frequently wedging themselves so firmly against the sides of the pot as to almost entirely stop all possibility of the air passing through the bed of fuel.

I believe the foregoing is sufficient evidence to warrant greater attention to combustion, and that the kinds of fuel that will be consumed have a logical bearing on the entire design of the furnace.

Import of Correct Fire Pot.

Knowing, therefore, what will happen in the ordinary fire pot a radical change in design will be necessary. Slotted pots are very much of a question, for they either deliver an excess of air or the slots become closed, making same no better than an ordinary straight side pot, and what is true of the pot is also true of the grate. My experience has demonstrated that no air should pass through the center of the fuel bed, and that combustion should take place at outer edges

J. B. Fehlig, Treasurer Western Warm Air Furnace and Supply Association.

of the pot as the gases driven off when air passes through the center are too rich in carbon for proper combustion.

With such conditions existing in the fire pot it is in my judgment essential to give it further consideration. Let us assume that one inch is the proper thickness for durability and efficiency. Then, every added amount of iron will produce latent heat which for illustration will be the same as the latent heat in a quantity of water below the boiling point in a steam boiler or to give another illustration, the amount of additional heat required to bring a wash boiler full of water to a steam point as against the required heat to bring the water to a steam point in a tea-kettle. Therefore, if you add wings and flanges sufficient to equal in weight a fire pot two inches thick you increase in proportion the latent heat which lowers the temperature of the pot and naturally reduces the velocity of the air. However, if you extend flues on the sides of the heater of a tubular type, up to a certain temperature wherein the rays of heat are not excessively strong the air within the casing will increase in temperature and naturally in velocity, and in this case heavy castings prove satisfactory, but from the point of economy in construction as well as efficiency, if the fire pot was five-eighths of an inch thick and a sufficient number of wings were added to bring same up to the standard pot of one inch thick. We believe this construction most efficient as well as economical as the same will serve as a safety valve or governor to the pot. This same system will also apply to all radiating surfaces coming in direct contact with the fire.

Ratio of Radiating Service to Grate Surface.

The proportion of radiating surface to grate surface is one of vital importance. After careful consideration of tests in the past we have concluded that approximately sixty-five to seventy per cent of the heating surfaces should be direct heating surfaces, and thirty to thirty-five per cent flue surface. But we still know comparatively little about the amount of heat transmitted. Some engineers have assumed a heat transmission of 1800 British Thermal Units per square foot of direct radiating surface per hour under full load and, therefore, the ratio of grate surface to heating surface is still a question, for there is another factor that has not been given consideration, namely, the shape or design of the direct heating surfaces.

Heat rays and their effect have had very little consideration in the past, and as you know that heat rays travel at right angles to the casting can you imagine what happens when the shape of the heating surface is such as to have the heat rays cross one another? Is there not a possibility of compounding the heat energy thereby?

A professor in one of our universities made the statement recently that he believed that the heat radiated from the casings was the only reason that many furnaces gave any results at all. The indirect radiating or flue surfaces also need much further consideration. The ordinary top radiator has shown itself somewhat of a question in past tests and from what we can determine if it were not for the heat rays from the combustion dome being thrown upon the radiator it is questionable if the surface of the radiator is worth the cost of the iron, as we all know that the bottom of the radiator as well as the sides becomes covered with soot and ashes to such extent as to insulate the iron to a very marked degree. In order that you may judge these statements take off the upper section of the radiator of any furnace of such type leaving lower section covered with soot and ashes, project a pipe four to six inches into the dome and attach smoke pipe to it; recase the furnace, fire it, and I am sure you will have a surprise coming.

Casing areas are also a big factor. One feature that often helps out a heating plant, that is, when the resistance of the plant is high, then the air passes through very slowly and enters the rooms at a high temperature. On the other hand, if the resistance is low the air passes through easily not receiving as much heat and, therefore, entering the rooms at a very low temperature.

It would be no trouble to keep you here for another hour, for there are still many other features that require much thought, such as *humidity, automatic regulation, ratings, air circulation, fan systems, forced draft* and installations in general.

Furnace of Future Will Be Much Changed.

I am sure you will agree with me that the furnace of the future will be a much changed article. Therefore, allow me to recommend to the furnace manufacturer that he engage a competent engineer. Give him a free hand in his work and while he should not look for large immediate results, I am sure the returns therefrom will be well worth the cost.

The University of Illinois at Urbana, under the able leadership of Professor A. C. Willard, and in cooperation with the National Warm Air Heating and Ventilating Association, have been carrying on a series of tests of warm air furnaces. The work they have done and the discoveries that have been made are, in many instances, startling, and the data that will result from these tests will have much to do with the standardization of the warm air furnace of the future. There is a standing invitation to every one to visit the laboratory and those who do not avail themselves of the privilege are losing much. The inspiration one gets in seeing what has been done is well worth the trip.

Let's quit condemning, quit throwing stones, fight for better installations, go to praising and adopt the slogan, "Heat With Vaporized Warm Air."

The next address of the meeting was on the subject of "Costs—Terms—Shipments" by E. C. Anderson, manager Furnace Department, The Buck's Stove and Range Company, St. Louis, Missouri. Mr. Anderson called attention to certain practices which have more or less imperceptibly grown to alarming proportions in the trade. He indicated the necessity for revision of such practices and the the adoption of better methods of business in the handling of credits.

There is still much controversy concerning the merits and demerits of the pipeless warm air heater. Perhaps much of the unfavorable impressions caused by this type of furnace is due to faulty installation and inadequate proportions. These and other faults were discussed by A. O. Jones, President United States Register Company, Battle Creek, Michigan, in the following address on pipeless furnaces:

Address on "Pipeless Furnaces," by A. O. Jones, President United States Register Company, Battle Creek, Michigan, Delivered to the Meeting of the Western Warm Air Furnace and Supply Association, June 8, 1920, in Peoria, Illinois.

You no doubt are familiar with the disadvantages or possible advantages of the pipeless furnace, and anything that I may say on this subject will in all probability be repetition.

However, there is one important thought which I wish to bring to your attention. To avoid if possible the injustice to pipeless furnaces that has befallen the regular warm air heater or pipe furnace, and that is to prevent, if possible, the installation of small heaters or the installation of heaters with insufficient air supply.

As a rule the pipeless furnace installation is a second choice or when a pipe installation costs too much a pipeless is used. They have been reasonably successful because the duplex gratings are so constructed that as much or more space is provided for cold air return than for warm air, for instance a 40 by 40 duplex grating has an unobstructed air space of 1,067 square inches with a 30-inch pipe connection for warm air, which pipe is obstructed at the top with the grating leaves, but 471 square inches for the warm air opening and 596 square inches of unobstructed space for the cold air return, and all sizes of duplex gratings are proportioned with the greater amount of space for cold air return, which is a good fault.

Unfortunately, when the average dealer in pipeless furnaces is deciding on the size to be used he does not take into consideration exposed wall surfaces and glass surfaces, but in many cases he guesses at the size of the heater to be installed.

When we think back a few years or to the period from 1900 to 1910, we remember the warm air heating and ventilating installations, included heaters large enough properly to heat and ventilate the buildings where they were installed, and the heaters were supplied with fresh air ducts having unobstructed area equal to the combined area of all of the warm air pipes, and each warm pipe had an area based on the exposed wall surface, glass surface, and cubical contents of the room to which it was to supply warm air.

These heating and ventilating installations cost the owners of residences from $300 to $500, and were well worth all they cost.

Inadequate Furnaces Installed.

Year by year new firms entered the warm air heating field, some not as well informed as they thought they were, some not as conscientious as they should be. These were influenced by furnace salesmen who were not as well posted as they should be, or as they thought they were, and in many cases the dealer was persuaded to install a small heater with insufficient air supply, and with small warm air conductors and small wall stacks and small registers. In many cases a 44-inch heater with a 22-inch fire pot was installed when the building to be heated, required a 52-inch furnace with a 26-inch firepot, or maybe a larger size, but if he figured on the larger size with proper air supply which would have heated and ventilated the building properly and thoroughly, he would of necessity had to make his figures for the completed installation in the neighborhood of $300 or $500, and he feared his competitor might make a lower figure and he would not secure the contract or the purchaser may have told him to sharpen his pencil and get below a certain figure, if he wanted the job.

Results of Competitive Bidding.

So to make sure of beating his competitor or competitors he would figure the smallest possible sized heater, lessening his cost a few dollars on this item, he would reduce the size of the warm air registers sometimes, from a 12 by 15 to 10 by 12, or from a 10 by 14 to a 9 by 12, and at the same time he would figure on smaller warm air pipes and smaller wall stacks, in an endeavor to get his bid low enough to secure the contract.

It is not hard to guess what the result was in such cases, the heater failed to give satisfaction, and the crime was not charged to the furnace dealer, who installed the heater, nor to the furnace salesman, who recommended the cheaper installation, but the blame fell and in such cases always falls, on the warm air heating business, and the warm air system of heating is condemned.

Each year the furnace dealers seem to continue reducing the size of the heaters, registers, pipes, etc., until the warm air heating plant is now often referred to as a "Hot Air Furnace."

In the territory east of New York State and in some parts of Eastern New York, the warm air heating and ventilating system is not known, for practically all dealers, purchasers and users have come to refer to the small furnaces such as are installed there as hot air furnace. They have a 16-inch or 18-inch fire pot and are connected with 8-inch warm air pipes and 3½ by 10 wall stack which extends from

the basement to the third floor with an 8 by 10 floor or pancake register attached to this small wall stack just above the base board for heating a room on the first, second and third floors. These kind of installations are properly termed "Hot Air Furnaces," and should not be confused with the Warm Air System of Heating and Ventilation which this association advocates.

While I would dislike to be classed as an advocate of the pipeless furnace, the fact remains that in most cases where the pipeless furnace has been installed in the territory east of New York State, especially, they have done the Warm Air Heating interests more good than harm, because in almost every instance where a pipeless furnace has been installed it has delivered to the living rooms of the house where installed all of the warm air that could pass down the outside of the duplex grating, and return through the center of the same duplex grating after being heated, while with the Hot Air Furnaces that have been installed there, a larger percentage of the heat from the small heater—which has already been described—is radiated in the basement, because the small warm air conductors and inadequate air supply are not sufficient to insure perfect circulation.

Imperfect Installations of Pipeless Furnaces.

During this past winter my attention was called to several imperfect installations of pipeless furnaces, for instance in one case a 60-inch heater with 30-inch pot was installed with a 40 by 40 duplex grating for heating a two-story store 60 by 100, and 16 foot ceiling, where both first and second floors were used for store purposes.

This 40 by 40 duplex grating has an unobstructed air space of 1,067 square inches—as explained above. But 471 square inches is the portion for the warm air as a 30-inch warm air pipe was used and when the obstruction of the grating was deducted it left but the 471 square inches for warm air.

If this sized heater were properly installed for heating the store building in question a grating for the warm air alone would be not less than 36 by 36 with an unobstructed air space of 648 inches and a cold air supply of like capacity should be used for supplying the heater with cold air, and this would have properly heated the first floor of the store building in question.

A second heater of like size would be necessary for heating the second floor of this store building.

This pipeless heater was connected to the first floor and the surplus heat from the first floor was expected to find its way to the second floor, of course neither floor was heated and the Warm Air System was condemned, not the firm who installed this job nor the pipeless furnace, but the Warm Air idea was all wrong if you could believe the owner of this store.

If installations of this kind would be blamed to the Pipeless Furnace idea, and not have the warm air heating and ventilation interests suffer, it would not be so serious a matter, but to prevent injustice being done the Warm Air Heating and Ventilating interests, we should work to the end that wherever pipeless furnaces are installed they at least have a chance to heat what they are capable of heating by seeing to it that the proper amount of air is supplied to the heater and sufficient space for the warm air to pass into the room being heated, but above all, we should prevent, if possible, one heater being called upon to do the work of two.

Use of Appropriate Registers.

The improved large base-board registers recently put on the market for pipeless furnaces with separate cold air returns, can safely be recommended for pipeless furnaces in place of the unsightly duplex grating, for with their use, the area of the warm air conductor and return air supply would not be limited.

The warm air heating and ventilating installations would be greatly improved, as well as pipeless installations, if the dealers and in some cases the salesman were taught that it is just as important to take into consideration the exposed wall, surfaces and glass surfaces both of which are cooling surfaces, when figuring the amount of pipe area necessary for heating a building.

In the case of a proper pipe heater installation, the pipe area for the different rooms should be added together, and a heater should be selected with sufficient air space, between the heater proper and the casings of same to allow this amount of air to pass through easily, and it is of equal importance to have a fresh air supply equal to, or at least 90 per cent of the combined area of the warm air pipes.

This also applies to pipeless furnaces, and the same rules should be followed, and the same care taken in either case.

I wish to repeat what I have said many times before. If the owner of a residence is willing to have his home disfigured by the use of the unslightly duplex grating, which in same cases looks to be half as large as the floor space of the room where it is installed, that he will get 100 per cent more warmth from the same sized heater, than is possible from the Hot Air Furnace installed with the 8 by 10 registers in each room on three floors, supplied with a 3½ by 10 wall stack and an 8-inch pipe, as is done with the majority of installations in Brooklyn, Newark, Philadelphia, and many eastern cities, where the warm air systems of heating and ventilation has become a forgotten art, but is coming into its own, by the introduction of the pipeless furnace, where the living rooms are heated warmer than the cellars.

The prediction is made, and is concurred in by those conversant with the way the warm air heater has been abused or imposed upon in the cities referred to, that in a short time the real warm air system of heating and ventilating will be demanded on account of the improved results obtained from pipeless furnace as compared with the small hot air furnace with insufficient air supply, and also because steam and hot water systems have failed to give satisfaction in residences owing to the lack of ventilation, and the large amount of fuel necessary to operate them.

Emphatically affirming that the members of the Western Warm Air Furnace and Supply Association should not allow the trade discount system to become a factor in the sale of their goods or in the minds of their salesmen or in relation with their customers and their profits, V. H. Parks, Meyer Furnace and Supply Company, Kansas City, Missouri, delivered an aggressive and illuminating address on the subject of "Trade Discounts—Their Uses and Abuses." He said that no one firm or individual working alone can correct or overthrow a system that is so susceptible to contortion by both buyers and sellers. Consequently, in his judgment, collective action is indispensable in order to remedy the abuses which have resulted from trade discounts. His speech is herewith reproduced:

John H. Hussie, Secretary Western Warm Air Furnace and Supply Association.

Address on "Trade Discounts, Their Uses and Abuses," by V. H. Parks, Manager the Meyer Furnace and Supply Company, Delivered to the Meeting of the Western Warm Air Furnace and Supply Association, June 8, 1920, in Peoria, Illinois.

Trade discounts and their uses and abuses is a subject that spasmodically receives very serious attention from different bodies of business men.

It is a subject that can be clothed by its advocates in a garb of any convenient color or character. This distortion, or more correctly speaking, entire hiding of its uses, and the corrupt practices have alone made possible that many arguments launched by silver toned orators, many of whom fill their positions as credit men or sales managers as mechanics fill their places at our benches on a piece work basis, or as specialty salesmen go out as a part of a campaign to place a certain volume of business regardless of the comebacks that follow in the wake of such operations.

These "put-the-sales-over" sales managers, and the "col-

lect-the-account" credit men are not only too numerous to be counted, but are a few of the many arms of both the "Big Business Octopus," and the ever present underfinanced whose development and often livelihood depends on stimulated sales and collections.

When we discuss this, or any other, of the many serious conditions that we, as an association, are so eager to take up and find among the fusion of thought and discussion the true light or the real foundation from which to see or work by, we must above all things keep in mind this important fact. We are owners and managers, which is absolutely one and the same thing. There is no middle ground. There is no Sales Managers' room, or Credit Men's desk for us, but there are in each year, thirteen infinitesimally small spaces of time in which we are brought face to face with twelve monthly reports and one yearly report.

In each and every one of these casting us of the net results, are included the good and bad effect of business methods. In our debtor column we find not alone the trade discount allowed; we have also the adjustment expense of an extra call, or our own time lost because of an argument arising over our remonstrance against the taking of an unearned discount. We also fail to find in the credit column the sale which did not come to us because of some past misunderstanding.

Evils of Discount Abuses Can Not Be Exaggerated.

The evil results that arise from the abuses of the discount system can not be exaggerated. The different phases of the abuses of the Trade Discount system can not be enumerated. Every time there is a birth in our nation there is a possibility of another. Every time a new man starts his career as a salesman there is a new confusion regarding the dating of pipe and fittings, and registers, and furnaces.

Every time there is a complete job sold there is a question of terms and discounts.

The abuses of the Trade Discount System are more than anything else a tendency toward cutting prices, and too often it is more than a tendency.

The abuses can not help but act unfavorably upon the ethics of pure business standards, as they are a relaxation from an office system. They open a way for the small customer to ask for special favors, which if once granted pave the way for more requests of the same nature. A refusal for these small favors begets a little seed of dissatisfaction on the part of the customer, and takes away from him and us his wholehearted enthusiasm and co-operation as a distributor of our line of goods.

Selling Points of Goods Are of First Importance.

The salesman who has 5 per cent cash discount on his line goes at this customer with a line of talk as if he were selling bonds. He entirely forgets the good selling points of his goods. He gets in the habit of talking price, when the whole enthusiasm should be bound up not only in his line but in the uplift of his warm air heating business—the business to which we have all dedicated our lives or at least a major part of our time.

Why should we allow a system like this to become a factor in the sale of our goods, in the minds of our salesmen, in our relation with our customer and in our profits.

We have an ever present duty in our profession as heating engineers, as general managers of our manufacturing plant, as the Sales Managers of our firms, and as the credit men of our office, and some of us as branch managers carry a burden of all but manufacturing.

Nearly all of us were present at the meeting at Des Moines and were not only interested and strengthened by Mr. Lamb's sturdy straight from the shoulder statements about his experiences, and how one little over-deduction of $12.00 was finally collected, but the recital of those facts go to prove how very questionable are the merits of a system that begets such fruit. I am convinced we can not all display the same tenacity as did Mr. Lamb. There is no easier way, and that is: get another order and make it up there.

Does Trade Discount Help Collections?

The argument that 2 per cent trade discount stimulates collections will not prove itself. The customer who can discount his bills will pay at maturity. There is no profit in allowing 2 per cent trade discount per month when money can be borrowed at 6 per cent or 7 per cent.

If trade discounts could be made large enough so that failure to take advantage of them would indicate conclusively that the buyer was more than lenient with his own collections, or even financially embarrassed and, therefore, operating his business on capital furnished by his supply houses, the system would have one point of merit which it now lacks.

If trade discounts could be made large enough so that they need only be allowed with C. O. D. or Bill of Lading shipments, they would be taken advantage of more than they are under the present system.

If trade discounts were entirely abolished, and the same loss or allowances used by the seller as interest on longer terms on pipe, fittings, and registers when sold in stock orders for early spring shipment, an increase in business would be shown in the season prior to the active building period.

It is difficult to estimate to any degree of accuracy the amount of furnace work that is done by very small and underfinanced shops. It is equally hard to tell to what extent the withdrawing trade discounts and the extensions of longer terms would effect or stimulate the interest in furnaces. But it is a fact that there is nothing in the trade discount system that in any way tends to interest either the large or the small shop other than to drag their attention from the quality of goods being sold them, and to train their thoughts entirely on the price.

For the good of the furnace business, price and discounts must not be the selling argument.

It is stating a fact to say that out of the bunch of salesmen's reports laid on our desks each week we can tell in from 6 to 8 cases out of every 10, if another furnace salesman has preceded our own by a few days. It is always written between the lines whether our salesman means to or not.

Trade Discount Makes Trouble.

One customer wants us to advertise, the next to consign, the next a special contract of one kind or another, and so it goes on and on until at last find the one report that a shop is pushing harder and harder on high grade work, and a customer tells our representative that the heating plan furnished him helped to sell a good job, and that the buyer or committee he met and talked with about his line were impressed with his talk, and asked him to go deeply into every detail, and that when all was said that could be said, in the first meeting, and it was time to go home, they shook hands, and said, "Young man, you have really told us something about heating and ventilating, and we appreciate it, and will see to it that your proposal is accepted." Then we feel that there is something to talk about besides price, and a trade discount, that is in itself without merit and is an expense and trouble maker.

I understand from my talks with others engaged in our line of business that there are two separate and distinct reasons why we allow trade discounts. Every one would discontinue the practice at once if they were the only firm engaged in business, but as they are not, they continue, first because the abuse system is in universal use, and second because by allowing more discount than the regular 2 per cent they have a selling argument which is susceptible in many arguments and appeals to earnings which do not materialize.

Collective Action Is Required.

Our one hope is of eliminating the *abuses* of Trade Discounts is in allowing them to apply only on strictly cash transactions.

Our one hope of eliminating both trade discounts and their abuses is to strike them from our terms entirely.

Our one and only hope of correcting or modifying the system and its abuses is in organized and concentrated effort.

No one firm or individual working alone can correct or overthrow a system that is so susceptible to contortion by both buyers and sellers.

Gentlemen, our own association offers us the opportunity to work together for the elimination of this and kindred commercial hardships which we labor under.

Other and stronger have easily increased the price of material we buy and arbitrarily set the only terms that can be obtained. Labor unions have increased the price of an hour's work by 200 to 300 per cent. The real masters of commerce and finance today control the very lifeblood and arteries of business.

Our association, like all others, is a depository, and when our individual box is unlocked we find held in trust for us just the equivalent of what we have put in. No matter what we want or make ourselves think we should expect, we will find only our part of the profits.

Neither my time nor yours nor the instructions of our secretary will permit me to go very far into the subject of association work, although it is the foundation of all or any work we do, or results we expect to get.

I must say, however, that a prosperous association is not a peculiarly shaped affair, or a great society. It is not like a high peaked mountain, and it is not a canyon, but it is just an ordinary high level plateau where we all get together to work.

The benefits are not man-made, but are simply the fruits grown from the seed brought by us as individuals.

The seed is our own business methods and will be good if we have a good way of doing business ourselves.

What Can Be Done by Associated Effort.

There is certainly enough business and executive ability in our small association to plan out small campaigns against evils that hurt us all, but which we are powerless to fight as individuals.

I would like to see the present different methods and percentages of trade discounts either entirely done away with by all wholesalers of our line of goods, or else a new method and better discount be allowed on strictly cash transactions. If this were done, the abuses would be practically done away with, and it would be rather a credit recommendation and saving to our customers to buy at least a part of their goods on a strictly cash basis and would further stimulate their collections to a very remarkable extent, while the tendency

now is growing more and more each year on the part of our customers to want to meet the terms of larger firms who are willing to take their pay in installments.

This last condition seems to be manifesting itself more, as the furniture and large house furnishing institutions have taken up the pipeless furnace business.

There is certainly a field for improvement and our officers and executive committee could render us all such assistance by working out and submitting for our consideration some plan that will help toward the elimination of the abuses of trade discounts.

Finding forty-four out of fifty furnaces improperly installed is certainly sufficient warrant for urging the adoption of legislation with regard to warm air heaters in the home. E. I. Dodd of the New Foundry and Manufacturing Company, Sioux City, Iowa, gave an abstract of the report of three thoroughly competent engineers who visited and investigated fifty heating plants with the result that they found only six of the furnaces properly installed. These and other facts form the basis for a thoughtful address by Mr. Dodd on the subject of "Legislation for the Furnace Man." The address is herewith reproduced in full:

Address on "Legislation for the Furnace Man," by E. J. Dodd, of the New Foundry and Manufacturing Company, Sioux City, Iowa, Delivered to the Meeting of the Western Warm Air Furnace and Supply Association, July 8, 1920, in Peoria, Illinois.

The legislation program appears to me at this time very much like the subject "Creation" appeared to the Negro preacher one Sunday morning as he became well warmed up to his subject. He said:

"Brothers and Sisters: Dis am de most vociferous question contained between the two covers of dis heah Bible. And, dat you may be better able to analyze dis great, stupendous and hypothetical question, allow me to state fust of all, for your most profound edification, dat everything dat was created was created because it was badly needed." As I look into the future of the furnacemen and the furnace business, I see nothing that is more needed than legislation.

I do not wish to imply that the manufacturer or jobber has committed any crime against the public, but on the other hand, the crime has been committed against the manufacturer and jobber.

I am proud of the fact, generally speaking, that I can truthfully say that the American manufacturers are building the best lines of heating goods known to the world, and the fact still remains true that their products, under proper installation, will do all claimed for them.

Then Why Do We Need Legislation?

If the gentlemen who were present at the St. Louis meeting in February will pardon me, I will again read a report for the benefit of those who were not present.

The facts submitted are a partial report of three thoroughly competent engineers who visited and investigated 50 heating plants and compiled the following data:

Six furnaces out of fifty were recommended as being properly installed. (Proper installation being defined as a furnace with enough exposed radiating surface to heat the cubical contents intended to be heated to 70 degrees with outside resistance to 20 degree below zero, with warm air leaders the cross sectional area of each to emit flow of air enough to fill the room every seven to eight minutes. The cold air ducts to equal the total cross sectional area of all warm air leaders where inside circulation is used, and 70 per cent of the total cross sectional area of all warm air leaders where outside circulation is used. Four other furnaces were passed as "fair."

Also it was found that 8-inch warm air leader pipes were being used in rooms as large as 15 feet 6 inches by 16 feet and no uncommon occurrence to find a 9-inch pipe where there should have been a 12-inch.

It was also found that furnaces were being used that did not have to exceed 60 per cent of the required exposed radiating surface to heat the cubical contents they were intended to heat.

It was also found that the cross sectional area of the return air ducts had been cut down to as low as 47 per cent of the total cross sectional area of the warm air leader pipes, and the common rule applied to return air in the 50 furnaces investigated was 60 to 70 per cent of the total cross sectional area of the warm air leader pipes.

One furnace was found of which the length of the shortest warm air leader pipe was 11 feet 6 inches from hood to boot, and that of the longest was 31 feet from hood to boot.

High Percentage of Fuel Wasted.

Also the measurement of the cubical contents of the buildings were taken, glass and outside wall exposure were noted, also the kind and amount of fuel used during a certain period of time, and basing the deductions upon the amount of fuel consumed, the number of heat units contained in same and the cubical contents heated, the fact was revealed that out of every 100 tons of fuel consumed, 40 tons were wasted, and this ratio of waste was determined after allowing generously for any possible errors in making the test. After making a 10 per cent deduction from this for ignorance and carelessness on the part of the public for not learning how to care for a plant, still leaves us 6 tons out of every 100 tons of fuel consumed that cannot be charged to any other account than the ignorance or the unscrupulous methods employed by the man who installed the job.

These facts would seem sufficient evidence why legislation should be enacted in favor of the manufacturer and jobber. Again, I believe you will agree with me, that the standard of installation has gained many points during the period of high prices and under-production. Also, it would seem that we are not awake to the obligations we owe ourselves if we do not grasp the opportunity to still further raise the standard and merits of our products while the public are in a receptive mood for legislation of this kind.

If we do not grasp this proffered opportunity, not of our own making, I can see nothing ahead but to lapse to the old method of cut-throat competition and the cheapest kind of installation.

It is useless to dwell on the myriads of inefficiencies practiced in the heating business. I dare say all of you are as familiar with them as myself, and, as I bring them to your recollection, I will venture to say that each one of you can see very vividly a mental picture of inefficiencies that can not be entirely eliminated through legislation but which can be greatly improved.

A Constructive Program for Legislation.

For just a few minutes I would like to take up a constructive program for legislation. I hope before this meeting is adjourned to have a committee appointed, known as the Association Legislation Committee. This committee to be composed of one member from each State covered by this Association. Each member appointed on this committee from the several States to be Chairman of a State organization appointed by himself, and such organization to become responsible for legislation in his State.

It would seem to me that the plan that should take shape would be for this Chairman to enlist every manufacturer and jobber in his State, also every dealer favorable to legislation. Also, if possible, to have the approval of the retail hardware men's association and the sheet metal contractors, as I understand these two associations make up from 85 to 90 per cent of the furnace dealers. I am sure many of the members of both associations would welcome legislation along this line, as many in both trades have been driven from the furnace business because they have refused to meet cheap competition.

Urges Adoption of Uniform Bill.

In conclusion, would say that I would make it the duty of the Legislative Committee of this Association to draft a uniform bill to be presented to the legislatures of the different States covered by this association, to be modified, if necessary, by the State organizations, to meet the requirements of each State, keeping in mind the idea of uniformity as nearly as possible. Also, it shall be the duty of this Association Committee, or any part of the committee, if called upon, to aid State organizations in securing the desired legislation.

I have used my best efforts to think out a workable plan for the securing of this much needed legislation but shall be very much pleased to have these plans discussed by members of the association and put into more feasible shape than at present.

At the close of Mr. Dodd's address the meeting was thrown open for general discussion. The jobbers were permitted to ask the manufacturers pointed questions and the manufacturers were allowed equal liberty in propounding pertinent queries to the jobbers.

"I have a son studying at the Harvard University," said one of the jobbers in attendance at the meeting, "and I'll wager a full size quart bottle of Kentucky inspiration against a pair of second hand shoes that we have received more education in this meeting today than he gets in a year at his school."

Making due allowance for the element of enthusiasm, the foregoing remark sums up fairly well the general impression of those who attended the meeting of the Warm Air Furnace and Supply Association, June 8, 1920, in Peoria, Illinois.

PRACTICAL HELPS FOR THE TINSMITH

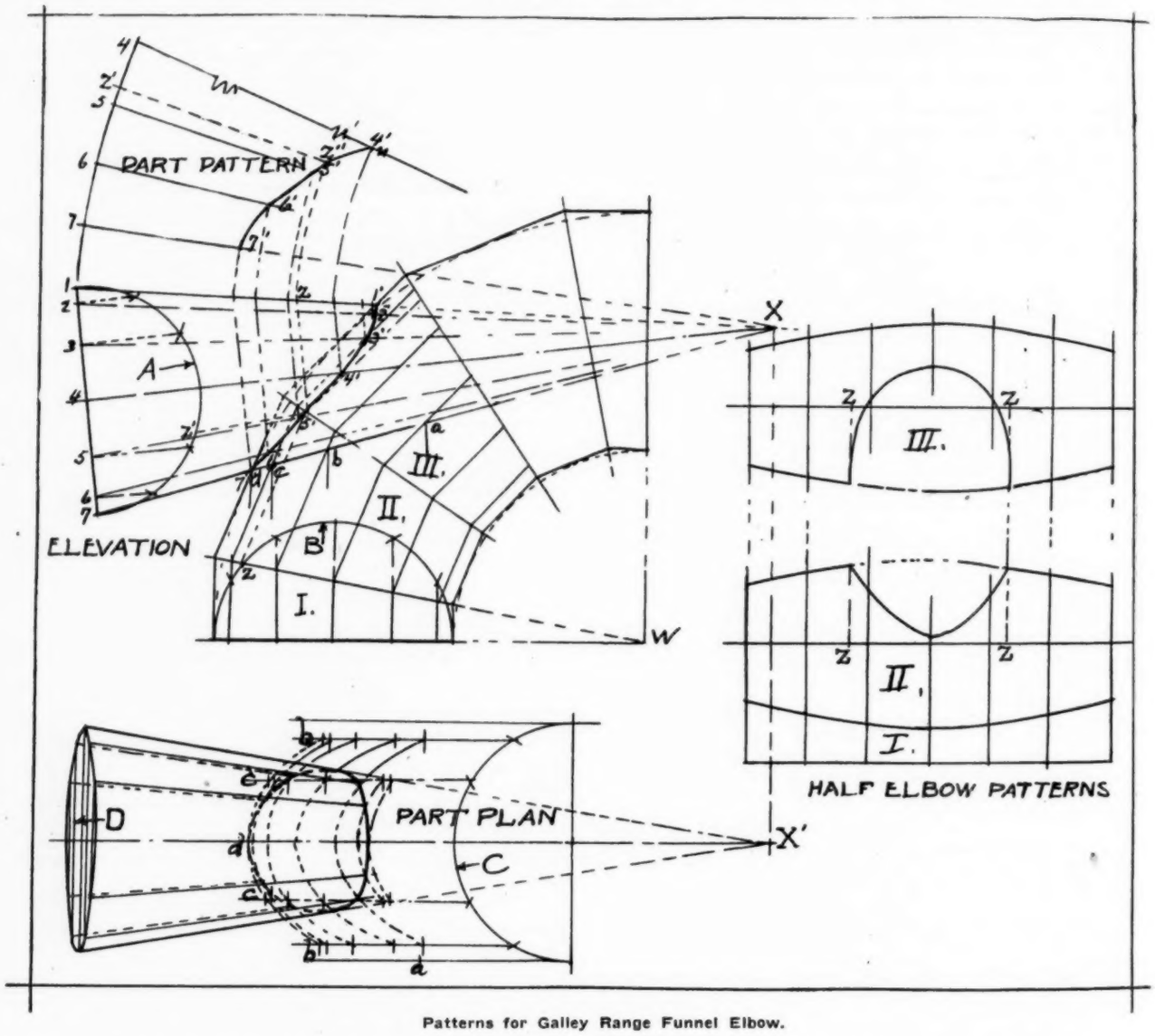
PATTERNS GALLEY RANGE FUNNEL ELBOW.

By O. W. Kothe.

Aboard ships where sheet metal workers must connect the galley ranges a funnel tapping into an elbow is often met with. In this case we tilt the funnel a trifle so it will be better understood. Observe funnel intersecting gore piece II and III, and notice the changes of diameters that must be taken into account when developing the miter line.

So we first draw an elevation of elbow and funnel to suit diameters and positions required on the job. Next describe the half sections A and B and divide in equal spaces and draw the elevation lines as shown. Now observe where the funnel lines cross the elbow lines as at a-b-c-d, and each similar line.

These lines develop parabola curves along the surface, and we must develop them in a plan view in order to get proper intersections. So we draw a center plan line, and drop a line from apex x to x', and reproduce section B as C with all its points, and from them draw horizontal lines. From all such intersections as a-b-c-d of elevation drop lines into plan on similar numbered lines, as a-b-c-d, etc., in plan. Trace this parabola curve, and repeat the same process for radial line 6-x of elevation. Continue in this way until all parabolas in plan are developed.



Patterns for Galley Range Funnel Elbow.

After this develop the plan view for 1-7 of A in elevation as shown by D. From these points draw lines to X', and where they intersect parabola lines of similar number, we trace the plan miter line as shown. By erecting lines from each of these intersections we cut similar lines in elevation as 1'-2'-3'-4', etc. Trace a line through these points and the working drawing is finished.

The pattern for funnel is swept from apex X. Lines must be squared up at right angles to the axis line on the slant line 1-x, and from here they are swept into pattern.

The elbow patterns can be stepped off the same as any ordinary elbow, only care must be taken so the high point Z is set in its correct position. The patterns are a simple matter to develop after the miter lines are established, but yet careful thought must be exercised so no oversights are produced. Laps for riveting of joints must be allowed extra.

DESCRIBES VARIOUS METHODS USED TO PREPARE SHEET METAL FOR SUCCESSFUL ENAMELING.

(*Continued from issue of May 29, 1920.*)

That a considerable saving in acid can be realized without materially cutting the time of scaling of ware covered with a normal amount of oxide is shown by the experience at one plant. Moreover, the quality of pickling was found to be much improved with the decreased acid content. The solution bath previous to tests contained an average of from 4 to 8 per cent of acid. To a tank containing approximately 300 gallons of water was added 104 gallons of 1.18 specific gravity hydrochloric acid, giving an acid strength of 8 per cent. On the second day about 26 gallons of acid were added, bringing the acid content to about 6 per cent. No acid was added on the third day during which the acid content averaged 4 per cent, after which a new solution was made.

Afterwards it was found from trials that 52 gallons of acid to 300 gallons of water and an additional 26 gallons the second day kept the acid content at from 4 to 5 per cent, after which the tank was emptied. This gave a more uniform run of pickling at a saving of about 25 gallons of acid per week and a decrease in blistering during enameling.

During the last year or two necessity for saving acids and their increasing costs brought to the attention of manufacturers using the pickling process a substitute in the form of niter cake—a by-product of nitric acid manufacture. Niter cake is an impure acid sulphate of sodium carrying a variable excess of sodium sulphate. Its acidity usually ranges from 28 to 44 per cent sulphuric acid, although the usual content is around 32 per cent. The cake usually contains some impurities such as small amounts of iron, alumina and silica and occasionally traces of arsenic or nitric acid. Pickling with niter cake does not differ much from acid pickling, except that for best results it is essential that the bath be kept close to boiling temperature. Where speed in pickling is desired it has been found advantageous to use a mixture of niter cake and sulphuric acid. The pickling capacity of 1 pound of niter cake is equivalent to 0.37 pound of 66 degrees Baume sulphuric acid.

The following data, the result of successful tests over a period of several months, give some idea of a mixture suitable for enameling plant pickling.

A typical run was as follows: The bath was made of 700 gallons of water with 275 pounds of 66 degree Baume sulphuric acid and 100 pounds niter cake. This gave an acid content of approximately 5½ per cent. The bath was then maintained at about this strength by the addition of about 30 pounds each of sulphuric acid and niter cake daily. It is possible that the actual daily requirement was high—due to the condensation of steam in the bath. This bath was used for a week when a new charge was made up. During this time approximately 3,500 square feet of metal was pickled each day. This bath was active and ware that required from 10 to 30 minutes in a hydrochloric-acid bath of 6 per cent acidity was put through this mixture in from two to four minutes with excellent results. One disadvantage of niter, especially when used alone, is its short life as compared with acid. This is due to the addition of sodium sulphate as an unavoidable component of niter cake, which rapidly increases the solids in solution.

The most satisfactory method of testing a pickling bath for acid strength is by titration of a 10 cubic centimeter sample of the acid against a normal solution of sodium hydroxide. The formation of a small permanent iron-hydroxide turbidity is taken as the end point. Each cubic centimeter of standard alkali solution represents approximately 1 per cent of free acid by volume. The advantages of niter cake solutions are saving in cost of pickling and absence of acid burning and etching when used. It is a material more easily handled than the sulphuric acid and if kept in a dry place will retain its original content of acid fairly well.

Pickling Requisites.

Essential conditions for efficient pickling are agitation and heating of the bath. Reactions are hastened if the temperature of the pickling bath is maintained at 160 degrees to 180 degrees Fahrenheit, and in the case of the niter cake boiling is highly desirable. The average enameling plant makes little use of agitation, although the sheet mills make use of it in all its various forms. The general methods of agitating are by means of steam outlets in the bath or by mechanical agitation of the ware or solution. Steam agitation is wasteful because of the condensation of water in the bath and the difficulty of getting steam outlets to stand up in use. In mechanical agitation the ware may be raised and lowered in the bath by means of a steam or air hoist or the acid level may be raised and lowered by a plunger device in the bath. The former is used where the charge of ware is comparatively light and the latter where heavy charges are carried in the bath. Some modification of these methods could be easily applied to the enameling process, especially in those plants where standard shapes are put through, with a considerable saving in cost of pickling.

(*To be concluded next week.*)

If you don't understand how your competitor can afford an auto, you might investigate. Perhaps he has installed a cost keeping system.

Proprietors are prone to take on too much detail. They should spend more time up in the pilot-house and let others throw in the coal.

National Association of Sheet Metal Contractors Gets Big Values from Its Annual Convention.

Smiling faces, the subdued hum of women's pleasant voices, and the joyous colors of their frocks, together with an unmistakable spirit of sprightliness and good humor distinguished the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors of the United States which was held on June 8, 9, 10, and 11, 1920, in the Gold Room of the Jefferson Hotel, Peoria, Illinois.

It was a happy gathering—earnest without being solemn. The sheet metal contractors and their womenfolk gave evidence of having learned the supreme lesson. That lesson is at once the simplest and the most difficult of all. It is, in brief, that business is human service—the satisfaction of human wants. Cornice brakes, treadle shears, pattern cutting, triangulation and soldering are dry, uninteresting things in themselves, just as mixing paints or weaving textiles or ploughing corn are monotonous when considered apart from motives and inspirations. Business and work are not ends in themselves. Indeed they are of little significance unless they contribute toward life and comfort. The lesson is that all striving is for the gaining of happiness. If profit alone be the motive life loses part of its riches, the smile fades from the men's lips and the light of love dies out of women's eyes.

Arthur P. Lamneck, Re-elected President National Association of Sheet Metal Contractors.

All of this does not imply a shirking of responsibility nor any failure to appreciate the seriousness of the difficulties, industrial, social, and economic, which beset every trade today. It means that the sheet metal contractors at the Peoria Convention have learned from long experience that smiling and good fellowship are the most powerful solvent of collective problems.

Tuesday, June 8, 1920.

The Convention began at 10:30 o'clock Tuesday morning, June 8, 1920, in the Gold Room, Jefferson Hotel, Peoria, with the singing of "America" by the assembled delegates. Mayor Woodruff briefly welcomed the sheet metal contractors and their ladies and said that they were in session not merely for the purpose of considering the problems which affect their own trade but also the problems which concern the people as a whole.

Arthur P. Lamneck, President of the National Association of Sheet Metal Contractors, responded to the Mayor's address of welcome and briefly reviewed the industrial situation with reference to the high cost of living and labor unrest.

He then appointed the following committees for the work of the Convention:

Resolutions.
W. F. Angemeyer, Pittsburgh.
R. J. Braley, Providence.
H. F. Brantham, Wilkes Barre.
Jno. D. Gerkin, Toledo.
Auditing.
R. R. Reader, Indianapolis.
Archie Hoffman, Sharon, Pa.
Frank T. Reuter, Kankakee.
H. W. Symonds, St. Louis.
Credentials.
H. B. McGrath, Cleveland.
Chas. E. Colbreth, Washington, D. C.
R. J. Behringer, Indiana.
Obituary.
George Harms.
W. G. Markle, Pittsburgh.
J. D. Ortmeyer, Evansville, Indiana.

The rest of the morning was spent in certifying the credentials of the delegates and discussing matters concerning the business side of the Convention.

The afternoon session opened at 2:00 o'clock with the report of the National President, Arthur P. Lamneck. He dwelt with strong emphasis upon the necessity of combined action and united enthusiasm as means of progress in the trade. He is an optimist and, therefore, refuses to be discouraged by the troubles which are worrying business men in other lines of endeavor. He has unlimited confidence in our country and people.

Edwin L. Seabrook, Secretary of the National Association of Sheet Metal Contractors, followed with his annual report showing a healthy growth of membership in numbers and influence. The text of his report is substantially as follows:

Report of Secretary Edwin L. Seabrook to the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors, June 8, 1920, in Peoria, Illinois.

Viewed from every standpoint the work of the Association during the year has been of substantial progress. The membership increase has been most gratifying. The finances are in splendid shape; the local and State organizations are on a more solid foundation than ever. The influence of the National Organization as a factor in the sheet metal industry, and in conjunction with the other large trade organizations in the business affairs of the nation, is freely acknowledged.

Organization Work.

The membership increase coming from all sections emphasizes the national character of the association. It is a long distance from Maine to the Pacific Coast, yet both sections have contributed to the membership during the year.

At the beginning of the fiscal year your National office planned three organization projects which were larger than ever before undertaken. This plan was to organize state associations in Pennsylvania, Indiana, and some kind of an organization or federation for the New England states, also to secure not less than fifty new members for the individual class. It is gratifying to report that all this has been accomplished.

A State Association was organized in Pennsylvania in January, Indiana in February, and a New England federation, including the six States in that section, in April. The Pennsylvania State Association has a good membership increase to its credit, and the same may be expected from the other two just as soon as they can perfect their plans.

Plan for State Associations.

The plan worked out for organizing State Associations has proved successful so far, but a word in this connection may not be out of place in answering the question: "Why not go on organizing state after state?" Securing the form of an organization may be easy, but to make it successful there must be a membership foundation, a membership familiar with association work and to fill the offices, who are not only willing, but competent, to carry on the work. In general, the local organization must precede the State Association. These conditions already prevail in several states, and there seems to be no reason why more State Associations should not be formed the coming year.

The following locals have been organized during the year:

Tacoma, Washington, 10 members; Portland, Maine, 7; Imperial Valley, California, 7; Canton, Ohio, 12; Sharon, Pennsylvania, 12; Washington, Pennsylvania, 6. The two latter the direct result of the State Association. Washington, Pennsylvania, being near Pittsburgh, it was decided to make it a branch of that local, thus connecting it with a strong organization. Cumberland, Maryland, the last week in May, voted to join the National. East St. Louis, Illinois, reorganized and reaffiliated with eight members.

The increase in the individual membership class of the State Associations is: Indiana, 20; New England Federation, 10; Illinois, none reported; Pennsylvania, 30; Ohio, 28; Wisconsin, 6; Atlanta, Georgia, 25.

Thirteen locals report increases, total..... 69
Five locals report decreases, total..... 10

The largest local increase was made by the Sheet Metal Consumers' Protective Association of St. Louis—22 members. St. Louis, with the combined membership of both locals, numbering 102, is the largest in the Association.

During the year 57 members were added to the individual class of the National Association, making a grand total of 295. From this, 27 deceased, resigned or were dropped for non-payment of per capita tax, and 30 transferred to local or State Associations. The individual membership is 238—the same number as last year.

The net increase in membership from all sources for the year is 206. State organizations, individual class, 91. New locals, 48. Old locals, increase and reaffiliated, 67.

It might be stated in this connection that in computing the membership the roster carries no dead wood, and never has.

Finances.

The attached financial statement gives in detail the receipts and expenditures and a comparison with the previous year. It might be well to note that while everything has advanced in cost, the Association has conducted its work with only a slight increase in expenditures, added a good sum to its surplus without any increase in rates from which the revenue is derived.

Fifteenth Anniversary.

The fifteenth anniversary of the National Association occurred last February, and was quite generally celebrated. Many of the locals recognized the occasion in some appropriate manner.

Chamber of Commerce.

The association continued its membership in the Chamber of Commerce of the United States for the present year. It was represented at the annual convention in Atlantic City by Norris Startzman, W. W. Smith and your secretary. The Chamber of Commerce is the big organization of business men of the nation, and is the one medium through which business can make its influence felt in legislation and otherwise. This association is asked among others to make a contribution for the erection of a building in Washington, D. C., for the exclusive use of the Chamber.

Industrial Situation.

I can hardly refrain from touching on one phase of the present industrial situation. Organized labor has shot its bolt. The third party, the great unorganized public, as well as those who deal directly with organized labor, are more than weary of the increasing demands, reducing hours and limiting output. Beginning with Seattle, a few months ago, one city after another has declared for the open shop. Merchants and organized business have in full page newspaper advertisements, in city after city, stated their attitude on the labor question.

The Southwestern Open Shop Association includes many cities in Texas, Arkansas and Oklahoma. The Operative Builders of Philadelphia, who erect thousands of houses yearly, and several branches of the lumber trade, declared for the open shop through newspaper ads. Chambers of Commerce are taking up the labor question. The open shop, or "American plan," as it is termed in Seattle, is moving from the West to the East.

The reports of the other officers and various committees will give a detailed account of the activities of the work of the Association during the year.

Edwin L. Seabrook, Re-elected Secretary National Association of Sheet Metal Contractors.

Membership Committee.

A Membership Committee of one from each state was appointed after the Columbus Convention, or continuing, rather, the one appointed the previous year. These committeemen were supplied with a list of names for solicitations, also suggestive letters as to form, etc. Some of these committeemen did good work securing members, others pigeonholed everything sent, as nothing was ever heard from them.

General Condition.

From the foregoing it must be seen that the condition of the National Association and State and local organizations is excellent. More than ever the great sheet metal industry is looking to this Association as the parent body that deserves support. The trade is organizing in various communities and asking to affiliate.

I wish to express my appreciation for the assistance tendered by our National President, A. P. Lamneck, the other officers, local secretaries, and many of the members during the year. Special mention of these would make a long list.

This Convention closes one of the most successful years in the history of the Association and begins another under larger opportunities, and increased obligations to the great industry it represents and serves. This Association now takes its place among the big, influential trade organizations of the country. The membership is on a solid basis and its high personnel needs no comment. With a continuous growth and an honorable and useful record of fifteen years as an incentive, let us go forward.

At the close of Secretary Seabrook's report, the treasurer of the National Association of Sheet Metal Contractors, Julius Gerock, presented to the Convention a summary of the finances showing a satisfactory condition of the organization's treasury. The principal address of the afternoon session had for its topic "Sheet Metal Work in Schools" by Frank Bruce, Publisher Industrial Arts Magazine, Milwaukee, Wisconsin. He was unable to be present at the session but his paper was read by Peter Johnson and listened to with earnest attention. The address in full is as follows:

Address on "Sheet Metal Work in Schools," by Frank Bruce, Publisher Industrial Arts Magazine, Milwaukee, Wisconsin, Delivered to the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors, June 8, 1920, in in Peoria, Illinois.

American education has been supplied the school children pretty much along the line of the law of supply and demand. You as citizens have made your demands on the schools of the country and the schools have responded. When schools have fallen down on the delivery, the fault can very frequently be attributed to the proper demand or rather, to put it in another way, to the support which we as citizens give our children.

At the moment, all industries are confronted with a labor problem. The problem divides itself as between the development of the skilled mechanic, who must become our foreman and superintendent, and the other forms of labor, sometimes called unskilled labor, which performs the more mechanical duties requiring a maximum of brawn and a minimum of brain. We eliminate the latter from our discussion. The next twenty-five years should find a tremendous development in labor-saving devices due to the high cost of all labor that the class of unskilled labor may find itself automatically projected into the skilled class by the revolutionary development of industry. This is purely projective, but nevertheless suggestive, I believe.

Apprenticeship System Has Disappeared.

Now the skilled mechanic in his development is coming into your shop and my shop along entirely new lines. The day of the apprenticeship system is gone. It was a faulty system—primitive in conception, wasteful in time, and unscientific in method. A good mechanic was not necessarily a good teacher, and cussing the apprentice was too often a habit. Very often the tradesman became a mechanic in spite of his teacher, not because of him. You all know what I have in mind. History has repeated itself in every industry.

The source of supply on your labor problem has, heretofore, changed and you must look to an entirely new development in the next few years. While school work is now well begun in a number of trade lines, my purpose in coming to this Convention is primarily to make the point that sheet metal work as a school subject has made little or no progress. This is due to a variety of causes. Of course, we are not interested in these causes. Our problem is a discussion of sheet metal work as an educational problem. Since your labor must come from schools, and since your trade is one requiring skill and training, the question resolves itself into this:

What are you doing in schools today? What subjects are being taught? Can we expect sheet metal work to rank with other subjects both on broader educational as a prevocational subject, and then in trade instruction as a vocational subject? The answer is decidedly, yes.

The Effects of Manual Training.

In our educational development we have found that all children will not respond to the same type of treatment. You are not interested in the educational theory or discussion which underlies our thought on manual training. The fact is that we have found in manual training an opportunity to train the mind through the hands, discover adaptability or aptitudes, and then prepare the child for the kind of life it wants and should live, as a useful member of society.

Manual training in schools as we have known it, for the most part, came to us through the idea of Russian woodwork and Swedish Sloyd. It started out by whittling, then jumped to carving, then took on project making down to later day forms of woodworking, including carpentry, cabinet making, pattern making, and the other types. Note that wood has been the basic raw material employed and note that our adherence to the use of wood is built on tradition, the convenience of the teacher, and the lack of appreciation of other materials so common and general as iron and steel, paper, and the others known as our basic raw materials.

Is It Practicable?

Now you will ask, "but is sheet metal work a practicable subject? Can it be taught as a prevocational subject? Then can it be taught as a trade or vocational subject? The answer is again in the affirmative. The fact we have done so little in the past is due to the peculiarity of your trade and your own appreciation of what schools could do for you. As I take it, your labor problem is now driving you to an intensive study of the problem and here I think I can help you.

In the first place, let me suggest that I believe sheet metal work in its more elementary forms can be taught in the 7th and 8th grades. Now this work at 13 and 14 years of age has a very significant thought behind it. As I said above, in the manual training work we can only discover the aptitude of boys. Why should all youngsters work in wood when so few are ever going to use it in later life? The wonderful development of printing as a prevocational subject has proven my contention. But here is sheet metal work. Given simple problems, good designs and a good teacher and sheet metal work is just as educative and educational as other subjects.

But here again the problem is the beginning. May I suggest that if you have a labor committee that you now change its name to a "vocational education" committee? If you have both a labor committee and an educational committee get them together and begin your work. It is going to be necessary to carry out the work in a big way. Your men must study manual training as it now is. Then you must get into the prevocational work right down to the trade school idea.

The Smith-Hughes Law.

The problem briefly divides itself in this way. Sheet metal work can be taught in schools: *First*, as a prevocational subject in the 7th and 8th grades; *Second*, as manual training in the high school without the vocational bent to it just as woodworking, printing, history, and geography are studied as an educational problem; *Third*, then there is the highly specialized trade school training high-grade foremen and superintendents for you, organizing the theory and practice of your industry and giving your entire work that background which the engineering schools give the engineer, the medical school the doctor, etc.

The teaching of all trade instruction is at the moment receiving tremendous impetus from the so-called Smith-Hughes Law. This law gives federal aid to all schools doing distinctively vocational work and making a direct tie-up with industrial work. It is of course, stimulating all forms of manual training. Best of all it is making all manufacturers recognize and turn to schools for real help in their labor troubles, and this will have an effect of course on schools and industries alike.

Under the Smith-Hughes Law two million will come back to school this fall for part time continuation work. If you employ in Wisconsin, New York, New Jersey, Massachusetts, a boy of 14 to 16 years and the boy takes some school work, say four hours a day, you as a manufacturer have the right to demand that this work have some direct application to your industry. The work is educational, of course. However, it is foolish to have a sheet metal worker go to school once a week and make shoe shine boxes, or necktie holders. A skillful teacher who can handle an iron can do some things so often which even a good superintendent misses because production is your problem, the problem of the school is how to get the production.

What Is Your Problem?

In all this you must remember that after all the various forms of education we are experimenting with are exceedingly young. Our accredited law schools are only 25 years old. Our medical schools of the highest order go back less than twenty years and so vocational education and its adaptation to your industry is comparatively young.

It is my idea that your committee on education should, as a standing committee, begin a thorough investigation of this entire subject. The problem should be approached from the angle of the general public, and then the strictly and intensely school angle. In a general educational way you should study the work of the lumber associations, state and local in issuing pamphlets, blue prints, booklets showing the uses of lumber. The making of a tin bucket is just as interesting as the making of a taboret or a necktie holder.

That is the general consumer problem. Now we come to the school problem. During the past year I have had occasion to check up the books on your industry. There is one good book, or possibly two, on sheet metal, and after you have said that, you are all done and ready to go. No industry worthy of the name can grow or prosper without its literature. Your trade paper as I know it is excellent, and I say this as a fellow publisher privileged to judge. The problem is not here, but with you and your willingness to put your experience down on paper.

Furnishing Teachers.

From your ranks there must come not only the literature of your industry, but the men who will teach the work. Your committee on education can cooperate with the local trade school committees. Your state associations are now in

close touch with the state boards of vocational education, but not enough. May I urge that since your labor problems are becoming so vital you make your educational committees in your national and state associations your important standing committee?

A very intimate personal friend of mine a few days ago came to me and began telling about what he had seen at our local trade school. The labor problem so far as he was concerned found expression and solution. I just permitted him to rave on chuckling to myself about my friend's ignorance. When I finally pounded home the idea that the apprenticeship system was gone, that schools were organizing the work better and more thoroughly, that the trades were following the progress of the professions and sciences in organizing the teachable facts and ideas to be transmitted from generation to generation, and that he had a personal responsibility in his trade association for cooperation and assistance to and through the schools, at that moment I realized that my standing with my friend had gone up several degrees and my interest through my paper in industrial and vocational education was absolutely accepted in his mind.

There are men in this audience with the vision of my friend and the foresight of all trade associations. I have come to you with a suggestion prompted by the progress of the Smith-Hughes Law. I know you have begun your work but I also know that your labor problem has now emphasized the necessity of real and genuine study of the general school and educational problem. Your progress, or rather lack of progress, is illustrated by the fact that but a few hundred schools have paid any attention to the subject.

The Changing Age.

That is your fault, not ours. Your vision of your subject is better than mine. There came to the schools through manual training a demand for carpentry, pattern making, cabinet making—all work in wood. With the automobile, the tractor, and more and motive power machinery we are passing into a machine or metal age. We have steel office furniture, steel building construction, steel railroad coaches. All of this changes the basic material from wood to another substance, lasting, durable and general in use.

The machine tool industry is coming into its own. Here we do not lack the literature or the educational background. Our work is started. Sheet metal work is a sister subject. With both there come the other trades and industries to me demanding recognition and attention in a magazine expressing the industrial arts. Your problem is to build your background through your educational committee, work out your problems, find your teachers, issue your literature and pamphlets and I assure you that you can count on the substantial recognition which should and must come with the passing of time to your most important industry.

Advocate Sheet Metal as Basic Trade.

Rome was not built in a day. To place so important an element as labor on a sound, and if possible satisfactory basis will require time. It is good for you you have had your troubles. A shortage of labor so often produces solutions just as war so often produces leaders. You have the vision and the foresight. Now comes the problem of getting your local association through your national association in touch with your local manual training people and your state board of vacational education. All other trades are crowding in for help and assistance. You will get just about as much as you go after. May I suggest, therefore, that with so little done and the problem so vital, a start be made to put sheet metal work on a plane of equality with the other basic trade and vocational subjects?

In the evening at 8:00 o'clock the meeting of the Old Guard members was held, devoted principally to reminiscences of the days when candle moulds, tin lanterns, and one-lunged automobiles were still in vogue.

Wednesday, June 9, 1920.

The morning session of Wednesday, June 9, 1920, opened at 9:30 o'clock by George Thesmacher of Cleveland, Ohio, on "Various Uses of Sheet Metals." He graphically illustrated the wide variety of everyday things which are made of sheet metal or which are distributed by means of sheet metal products.

The average sheet metal business man, he said, eats a breakfast many of the foods of which come in tin cans. The foods are prepared in sheet metal pans or kettles. On his way through the yard he passes a galvanized iron receptacle for the waste matter of the kitchen. He then enters his sheet metal garage to take out his automobile which is largely constructed of sheet metal. He arrives at his place of business and scrapes his feet on a sheet metal door pad. He opens his sheet metal door set in a hollow sheet metal frame. He puts his foot on a sheet metal slide of a sheet metal desk and reviews the Random page of AMERICAN ARTISAN AND HARDWARE RECORD. The filing cabinets of his office are of sheet metal.

Mr. Thesmacher told about how not many years ago the sheet metal trade was confined to spouting and roofing, whereas now there are countless uses, such as sheet metal moulds for the cement contractor, sheet metal fans for the buildings, sheet metal containers for motion picture films. He stated that the sheet metal contractors ought to go after more cornice work as sheet metal is in every way superior to other materials for that class of construction. He stated that it was the sheet metal man's own fault that his valuable business had dwindled almost to the point of disappearance. More time and effort should be spent, he urged, in reviving it.

He spoke interestingly of the days when automobiles were first being made and related how the manufacturer used to come to the sheet metal contractor for a dozen of parts which are now turned out by the thousands in large factories. He asserted that lack of foresight caused the sheet metal man of that time to neglect the opportunity to secure this business which has now grown to such enormous proportion.

Frank B. Higgins, Re-elected First Vice-President National Association of Sheet Metal Contractors.

In closing his talk, Mr. Thesmacher drew attention to the importance of the work of the Trade Development Committee and advised the members to pay the strictest heed to the suggestions which they would receive in the report of that Committee which was to follow his talk. He said that although he was not a member of the Trade Development Committee, he had become so engrossed in its work and so fascinated by its possibilities that he had served as a voluntary member of that body.

Report of the Trade Development Committee to the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors, June 9, 1920, in Peoria, Illinois.

Your committee herewith submits the following report of its activities during the year since the Columbus Convention.

The committee on returning from the aforesaid convention immediately proceeded to plan. All the variuos members appointed by the President were communicated with and a meeting was called for August 23, 1919, at Cleveland, Ohio.

Before that date the Chairman submitted a tentative plan to the members of your committee so each one could familiarize himself with the plan and make such suggestions as he or they wished to make. The plan as submitted and adopted is as follows:

Outlines Plan of Trade Development.

That a book be published, same to be about 9 inches by 12 inches, and to contain approximately 300 pages, the same to contain every part and branch of the Sheet Metal Industry as it enters into the construction, upkeep of buildings, equipment or for furnishings of buildings.

The matter to be compiled to cover the following:

Cornice work of all kinds with details, specifications and the proper painting of same.

Roofing in all its branches, specifications and painting of same.

Furnace work, covering installation and directions for correct method of setting and piping in all its various details.

Julius Gerock, Re-elected Treasurer National Association of Sheet Metal Contractors.

A code that is adaptable to any city ordinance as also a complete specification to insure proper furnace installation under city inspection.

Skylight construction, giving minimum bar sizes based on live load to be carried, also various standard details with complete specifications covering skylight construction under various conditions and to meet all conditions or demands that can possibly be met by a standardized plan.

Turret construction in its various phases, giving detail and good methods.

Ventilation, its importance and the importance of good installation. Details and basic rules for an effective and safe system.

Fire protecting and retarding devices, and the using of metal for such purposes.

Blow pipe work in its various possible demands and application.

Metal work as it is required in connection with slate and tile roofing.

Corrugated iron siding and roofing.

Gutter and spout work. Why only certain gauges should be used.

Hallow metal doors and trim. Distinctly a sheet metal product, its application and erection.

Metal ceiling and walls. How and why to use.

Expansion joints in all the various applications and necessity.

Preserving and painting. How to treat metals exposed to the elements and protect them.

The foregoing to be covered by details, and in each case a specification that can be used by an architect or engineer in the construction of new buildings, by an owner in repairing and by the sheet metal contractor as a guide for good and substantial work.

Financing Plan by Subscriptions.

The publication not to carry any advertisements, but to be financed by a system of subscriptions as follows:

The manufacturers to subscribe for a given number and each association to do the same.

That the books to be valued at $5 each, and this sum to be paid into the treasury of the committee.

That a central mailing bureau be established, all mailing lists to be sent to this bureau and all books mailed from this central point so as to avoid duplication.

The books to be mailed free of cost to architects, engineers, contractors and local associations.

Thus the matter gathered and compiled as planned will make a reference book that no office could be without. Its mission would be to develop a constant and growing demand for sheet metal, show why it is the best material, show the correct way to use it and why it is the best material that lends itself to any particular condition on every building no matter what the demand.

The committee met at the Hotel Statler on August 23, adopted the plan as submitted. The chairman was also requested to get into communication with the sheet and tin plate manufacturers, with a view of getting an expression from them. This was done, a letter being sent to Mr. W. S. Horner, President of the Association, and by him referred to Mr. G. H. Charls, Chairman of their Promotion Committee. The answer received by your Committee was to the effect that nothing could be done at this time on account of a survey that was being made by an advertising company.

As your Committee had no authority to spend money there was nothing more to do at this time. Considerable correspondence was indulged in during this period with all members of your Committee, and it was decided to hold another meeting at Chicago on January 19, 1920, which was well attended by the members of your Committee, and the following members of the Chicago Local Association: Messrs. Knisely, McConingh, Shean, McFarland and Daniel Stern.

The above named gentlemen were requested to remain in the meeting and to take part in the deliberations. Your chairman then presented another plan, but same was rejected, and need not be touched upon here, the original plan being enthusiastically voted satisfactory, because it does do what we are aiming to accomplish.

In discussing the possibility of making progress even against the odds of not having funds to work with, the following scheme was adopted:

Dividing Up the Work of Compilation.

That the firms represented take up a part of the work as they were equipped for, and if possible get the data into the hands of your chairman in time to incorporate same into this report.

The committee members were all assigned to various parts of the program and are working on the same at this time.

Ventilation—D. M. Haines, Chicago, Ill.

Warm Air Heating—George Harms, Peoria, Ill., and E. B. Langenberg, St. Louis, Mo.

Skylights, Windows, Sash and Louver Turret—Thos. P. Shean, Chicago, Illinois.

Cornice and Tin Roofing—P. F. Brandstedt, Washington, D. C., and Max Walten, Washington, D. C.

Corrugated Iron Roofing, Siding, etc.—Fred DeConingh, Chicago, Ill.

Fire Doors and Fire Preventing Methods—Paul L. Biersach, Milwaukee, Wisconsin.

Slate and Tile Roofing and Metal Work for Same—Harry C. Knisely, Chicago, Illinois, and J. C. McFarland, Chicago, Illinois.

Hollow Metal Doors, Trim and Metal Ceiling—George Thesmacher, Cleveland, Ohio.

Blow Pipe Work—No assignment.

Preserving and Painting—No assignment.

That is a summary of the work as accomplished by your committee to date, and we feel though the work is not yet in tangible shape, it is progressing. The ground work is done and the actual construction of this mighty important work can begin in earnest from this on.

Time Is Ripe for Serious Effort.

In the minds of your committee, there is no question of the importance of such an undertaking. We have felt for years that due entirely to our own inactivity and lethargy, to our inclination to let things so along, doing such work as would be presented to us good, bad or (and mostly) indifferent, it is time that serious efforts be made to correct this situation, that we get alive to the possibilities in our business, that the opportunities neglected by ourselves and grasped by others be held and made the most of.

Metal has for centuries been the basic value and fundamental medium of man work and activities. There is noth-

ing that can take the place of metal in any place or for any purpose, yet that very thing is being done every day with other materials, with and in other forms of metal. This situation must not be permitted to go on, if we do we will be relegated to an unimportant position in the list of business enterprises.

The Trade Must Push Its Wares.

Therefore, your Trade Development Committee is submitting this plan ready to be worked out on the basis of advancing the knowledge of the purchasing public, so as to make clear to this public what can be done with sheet metal and how we recommend it to be done. It is for us to push our wares and not stand back as we have been doing, waiting for dire necessity to compel the use of our material and thereby bring us trade.

Trade of this character will in the very nature of things get poor and of no consequence. We want to help build and create to erect the things that require brains and a master of the craft to produce them. We want our work to stand out, to be a thing of beauty, for to create and build such, requires training and that is what makes and keeps our business on a high plane.

Makes Six Recommendations.

To keep our business on a high plane, is the object of this undertaking and with this clearly before us your committee makes the following recommendations:

1. That the committee be continued as at present constituted and that the said committee have authority to add to its members as it may become necessary;
2. That an appropriation be made for the purpose of starting the actual work and that the fund thus appropriated be placed in the hands of a member of the committee, who shall be selected from the committee and by virtue of such action become its treasurer;
3. That a subscription list shall be opened at once to which all who wish to help in this work may advance funds; said funds to be returned to the contributor when funds secured through the sale of books will permit. This above list is not to be confused with the book subscriptions, as the money to be received by that method represents our income.
4. That consistent with the plan worked out your committee be given full authority to act with this object in mind, to complete the work as planned as early as possible, and to make it the very best that brains and money can produce.
5. That the cooperation of all corporations, firms and individuals be solicited to assist in the collecting and compiling of all data and necessary information, so as to insure the complete covering of our industry to the smallest detail.
6. That since this work is one that will last for years to come, that its character will be monumental and give the industry a stabilizing and standardizing so sadly needed, The National Association of Sheet Metal Contractors does and will give its best efforts to bring to a fruition the work started in 1915 and delayed only by the late war. That we recognize the importance of such work and that each and every local association will support this undertaking to its utmost morally and financially and that each and every member will as an individual assist in this undertaking.

It is for us to do this work, and in so doing place the keystone in the arch of the many constructive activities our national body has accomplished during its years of existence. It is for you to assist and boost, for this is constructive work based on constructive thought, and means better business, better and bigger earnings.

The assembled delegates were profoundly impressed by the foregoing report of the Trade Development Committee. They unanimously voted to appropriate $1,500 for preliminary work necessary to carry out the recommendations of the Committee.

Wednesday afternoon's session began with an address by Professor A. C. Willard of the University of Illinois, on the topic of "Warm Air Heating." The subject was divided into two parts. First he dealt with the furnace as a heating apparatus and then the entire system of a heating plant with its ducts, pipes and circulating and recirculating of warm and cold air. He discussed installation in general and briefly reviewed the results of experiments made by the Engineering Staff of the University of Illinois.

Professor Willard explained very clearly to the convention that this was a big job which they had tackled and that the co-operation and experience of all installers were needed to help substantiate the facts which experimentation had already brought out. He stated that the tests at the laboratory at the University of Illinois had shown that about 35 per cent of the heat value of all coal was lost before it ever reached the leader pipes. He explained that this lost heat escaped through the sides of the casing and that about 5 per cent of this heat was absorbed by the floor or ground on which the warm air heater was located. The greatest part of the warm air furnace research work at the University of Illinois was now being directed toward the elimination of this lost heat. He said that radiated heat traveled in straight lines as light does and that the only way to get the full benefit of the heat is to find some way of having the air pass over the greatest possible area of radiating surface.

Professor Willard said that the Furnace Research Department of the University of Illinois has plans under way for carrying on experiments with sheets of

R. J. Braley, Re-elected Trustee National Association Sheet Metal Contractors.

metal placed vertically inside of the furnace casing at the point of greatest radiation which, of course, is the firepot. According to the facts, these sheets will absorb a great deal of radiated heat and the air passing over them will be heated. He also stated that experiments were likewise going to be made in regard to stopping the loss of heat through the ground and floor.

Passing to the topic of pipes, he surprised many of the sheet metal contractors present by stating that tests at the University of Illinois laboratory had proved that uncovered bright tin plate delivered more heated air to the rooms than similar pipe covered with one sheet of asbestos. He declared that in order to obtain the same results with asbestos covering as many as six or seven sheets of asbestos paper would be needed. He affirmed that pipe the same size as leader pipe was not necessary and that the best results were obtained by using pipes smaller than the leader pipe.

He welcomed the opportunity to talk to the installers and explained that he was eager to obtain all the information of a practical nature which he knew

they could give him. Concerning the cold air return he told the delegates that they had obtained the best results by having cold air pipe take a straight course of 45 degrees to the casing of the heater and having cold air delivered as close to the bottom of the heater as possible, and if necessary have it extend one-half way around the casing.

The research workers at the University have found that by using this method they have eliminated as far as practicable the fault of having warm air travel in the wrong direction. In all cases, the Professor said, the heater should secure all the cold air that it could possibly take.

At the close of his address, Professor Willard answered many questions propounded by members of the Association. The members were very much interested in his address and were happy in taking advantage of the opportunity which it afforded them of exchanging thoughts and experiences.

Professor Willard was given a rising vote of thanks by the Association which was delivered with an enthusiasm that had enough swing and vigor to it to have carried the nomination of the Republican Convention in Chicago for anyone from Hoover down to the Third Assistant Sergeant-at-Arms.

Harry C. Knisely, Chairman Legislation Committee National Association Sheet Metal Contractors.

Then came the report of the Warm Air Furnace Committee which was read by E. B. Langenberg, of St. Louis, Missouri. Brief talks were made by George Harms of Peoria, Illinois, and Allen Williams of Columbus, Ohio.

John Hussie of Omaha spoke in commendation of the report of the Trade Development Committee and said that this convention was the most instructive and enthusiastic which he had ever attended. In the evening a smoker was held in the Gold Room of the Jefferson Hotel. Everybody had so much fun and the wit was so sparkling and the humor so good natured that it would take a whole issue of AMERICAN ARTISAN AND HARDWARE RECORD to do justice to its details.

If all other business men in America were as broad-minded, clever, and courteous as the Sheet Metal Contractors of the United States, the women suffrage movement would be under no expense whatever for its propaganda. They not only could have the vote any time they wanted it but any office in the gift of the people from the presidency down to the smallest movie picture censorship.

The ladies in attendance at the convention were entertained Wednesday afternoon with an auto sight-seeing trip and luncheon at the Ye Old Tavern. They had more fun than a crowd of high school girls could possibly have derived from a truck load of dill pickles and unlimited ice cream and lady fingers. There was not a woman over sixteen years of age in the gathering—no matter what the records in the family Bible back home may say to the contrary.

Disinterested observers maintained that the joyousness of the occasion was intensified, at least, by the social adroitness of the local Entertainment Committee consisting of R. C. Davis, Chairman, Ed. Harms, Carl Rapp, and C. I. Calvert. The names of all the ladies present were written on cards and placed inside a $200 A. B. C. electric washing machine. A drawing was then held and the following prizes distributed:

An electric iron was won by Mrs. J. B. Sauer, of Peoria, Illinois;

Casserole by Mrs. E. R. Kastien, of Peoria, Illinois;

Percolating coffee pot by Mrs. Louis Hoffman, of Milwaukee, Wisconsin;

Percolating coffee pot by Mrs. F. Bokern, of St. Louis, Missouri;

Percolating coffee pot by Mrs. J. D. Gerken, of Toledo, Ohio.

Happiness and happening are almost synonymous words. Good luck and gladness go together. It was inevitable, therefore, that the $200 A. B. C. electric washing machine should have been won by Mrs. R. P. Nailon, 227 St. James Street, Peoria, Illinois, who happened to be a bride married only a week ago.

Wednesday evening the ladies were entertained at a theatre party at the Orpheum, where an excellent company played "Peg-o'-My-Heart."

Thursday, June 10, 1920.

The morning session of June 10, 1920, began with an address on "The Advantages of Sheet Metal for Fire Prevention," by John Bogenberger, Milwaukee, Wisconsin. His address is herewith given in full:

Address on "Advantages of Sheet Metal for Fire Prevention," Delivered by John Bogenberger of Milwaukee, Wisconsin, to the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors in Hotel Jefferson, Peoria, Illinois.

Unquestionably no problem which confronts us entails more thought and need of earnest consideration and attention than the conservation of property and the reduction of fire waste. The ultimate object of all fire prevention work, in which the sheet metal industry can perform an important part, is the elimination of conditions causing the origin and the spread of fire, resulting in waste of life and property, as well as the financial drain on the whole community due to such conflagrations and fires.

An Important Factor.

Sheet metal has become at the present time one of the predominant means as a fire preventative and retardant where applied and in the construction and equipments of all modern buildings.

The common manifestations of fire are smoke, heat and flames, but as to the origin of fires most people, not excepting those engaged in fire work of one kind or another, merely consider the flames, forgetting that heat will act exactly like flames, only more slowly.

Meaning of Word "Fireproof."

Considerable controversies exist over the meaning of the word "Fireproof," but the decisions that present building methods have achieved are nothing nearer than what is clearly expressed by the phrase, "Fire resistive buildings" that are constructed entirely of steel, concrete, brick, stone or iron, reducing all wood work where possible to a minimum, thus creating a condition where the latter is in the great minority, constitute what are today termed "Fireproof."

How Community Can Protect Its Interests.

How can any community protect its interests? By making such improvements that will lessen the possibility and probability of serious losses by fire. No one expects that hundreds of thousands of inferior buildings throughout our country shall be torn down and replaced, though such a remedy would prove a wise investment for capital, but buildings that are proclaimed by Fire Underwriter authorities as dangerous can and should be improved by adopting modern methods for the prevention of fires and spreading thereof from room to room, floor to floor and building to building. What is the answer? Sheet metal applied wisely and correctly with

E. B. Langenberg, Chairman Warm Air Furnace Committee National Association of Sheet Metal Contractors.

the sanction of Fire Underwriters' specifications as a preventative and retardant.

Sheet Metal Fire Resistive and Fireproof.

Let us elaborate as to the best methods to be employed to make all modern structures in connection with our Sheet Metal Industry both fire resistive and fireproof, and also suggest methods for the employment of sheet metal work for buildings regarding such precautions as are necessary, both for the interior and exterior. Hollow metal windows glazed with wire glass should be placed on the exterior or in any light court openings. Metal fire doors on the interior at such points that would ordinarily need to be protected against fire. All hallways, elevator shafts and stair wells, can be likewise protected, preventing the creeping of smoke, flames and fire from one floor to another.

Metal Ceilings and Side Walls.

Metal ceilings should be used at advantageous places and installed according to standard specifications, sheet metal partitions installed in place of wooden structures. Objection is sometimes raised that fire doors spoil the looks of the place. This can be overcome by either installing Art Metal Doors or placing doors in concealed places. Metal furniture such as desks, filing cabinets, etc., can be installed and these numerations with the aforestated building materials will constitute a real fire resistive interior of a building. For the exterior, rehabilitate sheet metal cornices and other ornamental work for store fronts, and have them used in place of terra cotta and other materials which experience has taught us are liable to deteriorate through weather conditions and be dangerous to any community.

All Sheet Metal Roofs.

For the roofs, recommend all sheet metal, whether tin, galvanized iron or copper, whether laid in the flat, standing seam, or in other various shapes such as tin or galvanized iron shingles. Roof openings should have applied sheet metal skylights or scuttles. Pent house exteriors lined with sheet metal such as tin, corrugated iron, sheet metal ventilators used where consistent with conditions, etc. This elucidates a general condition with sheet metal as an important factor.

Sheet Metal Reduces Insurance.

Sheet metal construction in such various forms is of interest to any owner of buildings. The owner of any building has other things to consider besides ratio of losses to incomes which looms so large in the mind of insurance men. The owner pays insurance as an expense item to minimize fire losses. The insurance money received partly reimburses him for the fire damage done and pays a part of the cost of the restoration of the building. It does not, however, take care of such other items as

1. Maximum fire protection.
2. Minimum disorganization of business resulting from fire.
3. Peace of mind.

It behooves us all to consistently advocate sheet metal and their uses for fire-resistive and fireproof propensities and let us earnestly hope that our Committee on Trade Development will extensively bring this important phase prominently in the limelight in the book on Sheet Metal and their uses which they expect successfully to compile, publish and distribute to the building fraternity.

At the close of Mr. Bogenberger's address came the report of the Trade Relations and Policy Committee, consisting of Edwin L. Seabrook, Chairman, J. B. Wallig, N. H. Tripp, F. B. Higgins, and Rudolph Jobst. The report is as follows:

Report of Trade Relations and Policy Committee, Delivered to Sixteenth Annual Convention of the National Sheet Metal Contractors' Association, June 10, 1920, in Peoria, Illinois.

The cordial relations which have been growing for the past several years between the dealer and his source of supplies continue. The Association has constantly endeavored to cultivate and maintain these pleasant relations. This is evidenced by the invitations extended to all manufacturers and jobbers of sheet metal supplies not only to attend, but to take some part in our National gatherings.

The membership, however, is not so much interested in the cordial feeling and good-will as it is in the treatment accorded in the distribution of supplies. One year ago your committee said that for the three or four years previous it was able to give optimistic reports on the attitude of the manufacturers and jobbers in the distribution of their material, but that it regretted to say "that the pendulum seems to be swinging the other way during a portion of the past year." It is with the same regret that your committee must report this year that the pendulum seems to have kept on swinging in the same direction this year. In other words, despite the shortage of material, some have found enough of it to offer it direct to consumers. A big jobbing firm in a large Eastern city offered a building contracting firm two tons of sheets at the same price as sold to the dealer. When this offer was made the sheet metal contractors of that city were begging the jobbers for sheets.

The Distribution of Supplies.

The distribution of supplies in our trade arises from three sources: The warm air furnace, the sheet metal mills and jobbers, the manufacturer of building products who specialize in seeking out the consumer and selling him direct. The latter makes little or no pretense of protecting the dealer and very little in this line can be expected from him.

The furnace manufacturer and the sheet metal jobber must and do use the dealer to a large extent as the final distribution of their product. This being the case, it is with substantial reason that the dealer has a right to protection from these sources of his supplies.

Protests Against Branch Installing Offices.

The members will recall the resolutions adopted at the Columbus convention regarding the establishment of branch offices for the purpose of installing furnaces direct to the consumer by some furnace manufacturers. The action of that convention was a protest against such a practice, and that such protest should be sent to all the furnace manufacturers. This was done, and where a reply was not received to the first letter, attention was called to these resolutions in a follow-up letter. Quite a number of furnace manufacturers replied, placing themselves squarely in accord with the action of the convention. Others ignored both letters, which can only be taken as an evidence that they were not in harmony with the action of the convention or proposeed to continue the practice however detrimental it may be to many dealers.

In this scramble for the sale of furnaces one large firm advertised in a Western newspaper that its furnaces were

for sale by all reliable druggists. Perhaps this was an error of the printer, but it indicates at least the extent to which some are willing to go in disposing of their product. This same firm in the city in which this advertisement appeared endeavored to have a contractor and an insurance broker act as agent in selling its furnaces to the consumer.

Incompetent Local Agents.

Let us remind the furnace manufacturers that it is useless to preach high grade mechanical ability and A-1 installation at these conventions and to the dealer, and then hire business and professional derelicts as local agents.

In looking at the sheet metal part of the distribution is something like this: Despite the shortage of materials, not enough to go around among reliable customers, new, or rather renew, avenues of business in selling direct to their customer's customer is sought by some jobbing houses.

Your committee is of the impression that the practice of selling direct to the consumer, which has been discontinued in many sections, or at least rendered well-nigh unobjectionable to the dealer, is liable to come back with the return to normal times. At any rate, there are plenty of indications that point to this.

Functions and Opportunities of the Dealer.

The situation must be met by the dealer. The manufacturer and jobber are aggressive and seek business where it may be found. This attitude should inspire the dealer to do likewise. He ought not to let business that naturally belongs to him go by default to the source of his supplies. He should be alert as to the new lines which are being brought out and be the first to offer them to his community. The farmer is buying sheet metal products as never before, because inventive genius has turned sheet metal to many uses for him. The local dealer can handle these products if he will. He is in closer touch with the farming community of his locality than any manufacturer. If he will handle these products he can get the farmer and other customers coming to his place of business, which will furnish the best opportunity to dispose of his other lines.

The dealer can not sit passively by and expect the force of numbers to alter a condition that requires individual as well as collective effort.

Your committee renews its recommendations of former years to be aggressive and to use every honorable means to retain the final distribution of supplies to the customer.

Good business methods, publicity of the right kind will win where coercion and even an appeal on the ground of justice may fail.

The afternoon session of Thursday, June 10, 1920. was devoted to reports of the Overhead Expense Committee, Legislation Committee and Lecture Committee. Liberal use was made of the Question Box for the discussion of matters relating to various phases of the sheet metal trade. The report of the Overhead Expense Committee was read by W. D. McIlroy, chairman of the committee as follows:

Report of Overhead Expense Committee to Sixteenth Annual Convention of National Association of Sheet Metal Contractors, June 10, 1920, in Peoria, Illinois.

The Committee on Overhead Expense beg leave to submit, by its chairman, the following annual report:

The method of calculating overhead by a percentage on the productive pay roll having been approved and adopted by the National Association at the convention of 1918, the committee in its report for 1919 stated that the next, and perhaps the more important, step was the education of the trade in the method. To this end certain recommendations were made, embracing practically the plan of the Pittsburgh local, in giving instruction on this all-important subject. The report of the committee was referred to the Committee on Resolutions, and this committee in its report recommended the adoption of the "Pittsburgh method of education, and a copy be mailed to each local association and individual members," and the recommendations of the committee were adopted by the association. So far as known to the Chairman of the Overhead Expense Committee, the only copy sent out was that published in the report of the convention in the "Warm Air Heating and Sheet Metal Journal," July, 1919.

Cost of Production Is Most Important.

Manufacturing, buying and selling are important departments of business management, but cost of production is the department that is vital to success, the one item of cost of production that apparently receives but little attention, and the one that surely is but little understood, is overhead expense. It may reasonably be assumed that the small shops exert a most powerful influence on prices; this influence may not always be exerted directly, but it is there, indirectly perhaps, subtle and not to be denied.

In the sheet metal business there is no doubt that most of us have come up from the ranks, and it is also equally true that the start of most of us in the business world was in a small way, and if the opinion previously expressed "That small shops exert a powerful influence on prices" is correct, then it is at this period of our business life that we need education on overhead expense. It is not you gentlemen who attend these conventions that need this education as a general thing, but it is the far greater number who never come, and who probably never read up on the subject in the trade publications, that we must reach, if permanent and general benefit is to be derived.

Emphasizes Need of Education.

Understandings on prices may be of some help in the sheet metal trade, but even that is doubtful. In our judgment the only genuine improvement will be derived by education—education on the one item that is responsible for too low prices than any other. Materials and labor are items we all must be familiar with, but overhead expense is but little understood by far too many. How can we expect to get actual costs without this understanding?

D. M. Haines, Re-elected Fourth Vice-President National Association of Sheet Metal Contractors.

Recommends Method of Instructions.

It is the judgment of the committee that too much attention cannot be given to the subject by the association, not in convention, perhaps, but through local associations, in convention. It reminds one of the minister railing against the non-church goer—the ones he wants to reach are not there. The Committee on Overhead Expense set out to recommend the best practical method of calculating the expense for an establishment doing a general business; this they feel they have accomplished. They next recommend a good method of instruction, one at least that has proven quite satisfactory where practiced, and they now feel that there is but little for them to do, except for special matter that may be referred to them, that it is now up to the National Association for the education of the rank and file of the trade.

The committee extends its felicitations to the convention and recommends that "The National Association have printed and sent to each subordinate association and individual members a sufficient number of copies of so much of the Overhead Committee's report for the year 1919 as relates thereto, together with a sufficient number of copies of the blanks for demonstration purposes, that each member of the subordinate association may have a copy, and also a request to the subordinate association that the method be given a trial.

At the close of the afternoon session the delegates and their ladies went for a boat ride on the Illinois River which lasted three hours, when the boat docked at the Al Fresco Amusement Park where dinner was served. Free tickets were given to all the women for

the various entertainment features of the park and the merry-go-round never so fully earned its name.

The sheet metal contractors and their womenfolk then returned to the boat where they danced on its smooth upper deck to their hearts' content. John H. ("Harry") Hussie of Omaha need never fear for employment. A motion picture reel of his dancing would bring him enough royalties to sustain him in the topmost luxury in the most exclusive palace on Fifth Avenue, New York, for the rest of his day. At least seven of the managers of the leading cabarets in Peoria made him flattering offers at the end of the evening, after having seen him dance with Miss Cohn of AMERICAN ARTISAN AND HARDWARE RECORD.

The prizes for the dancing consisted of a package of cigarettes, a bar of soap, and a pound package of coffee, thus, clearly demonstrating the ability of the sheet metal contractors of the United States to combine joy and beauty with economy and utility.

Friday, June 11, 1920.

The concluding session of the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors was devoted to reports from State and local organizations affiliated with the national body.

All the officers were re-elected as follows:

President: ARTHUR P. LAMNECK, Columbus, Ohio;

First Vice-president: FRANK B. HIGGINS, St. Louis, Missouri;

Second Vice-president: JOHN A. PIERPONT, Washington, D. C.;

Fourth Vice-president: D. M. HAINES, Chicago, Illinois;

Secretary: EDWIN L. SEABROOK, Philadelphia, Pennsylvania;

Treasurer: JULIUS GEROCK, St. Louis, Missouri.

Trustees: R. J. BRALEY, Providence, Rhode Island; JOHN H. HUSSIE, Omaha, Nebraska; PAUL F. BRANDSTEDT, Washington, D. C.; and GEORGE HARMS, Peoria, Illinois.

Three new Directors were elected, as follows:

LEWIS LUCKHARDT, Pittsburgh, Pennsylvania;

RALPH REEDER, Indianapolis, Indiana;

PAUL BIERSACH, Milwaukee, Wisconsin.

CONVENTIONALITIES.

On the way home Wednesday evening, C. I. Calvert, of the local Entertainment Committee, by the exercise of front line strategy, managed to get away from the crowd with his automobile loaded to the gun rails with some of the most charming ladies of the convention.

Harvey Manny, of the Manny Heating Supply Company of Chicago, Illinois, wasn't a bit bashful. He introduced himself to all the ladies without wasting time with the usual drawingroom formalities.

E. W. Norman, President of the Travelers' Auxiliary to the Illinois Sheet Metal Contractors' Association was busier than a one-armed paper hanger with the hives working in the interest of the Salesmen's organization.

Ralph Blanchard, the original "Sunny Jim" of the Sheet Metal Salesmen of the World, was making powerful medicine for Illinois every minute of the day.

Only one mystery puzzled the Sixteenth Annual Convention of the National Association of Sheet Metal Contractors. At the opening of the sessions, the delegates learned that Tom Pearson of the Central Heating Supply Company, Chicago, Illinois, had left for Peoria, Monday afternoon. He did not arrive until Wednesday noon. It is hinted that he stopped to sell a carload of Lamneck furnace fittings, but the rumor has not yet been verified.

The third vice-president of the National Association of Sheet Metal Contractors, George P. Werner, of Galveston, Texas, said if he had to come from the other side of the world, he would not have missed the convention for all the money in the banks of Galveston.

J. V. Armhorst, of the Chicago office of Merchant and Evans, was easy to look at according to the confidential comment of the ladies.

It was like coming home from distant lands to see John Weigel and to feel the friendly thrill of his hand clasp. No sheet metal convention is a finished success without his presence.

Professor Willard made a hit with everybody. For one thing, he doesn't sling around jaw-breaking Greek words. He talks like a real human being and he knows how to put big facts into words that ordinary folks can get hold of without the use of the dictionary.

They say in St. Louis that the friends of Frank T. Bokern never have to pay any doctor bills. They don't know that they have a liver. He radiates so much good cheer that he keeps them all smiling. Everybody within a kilometer of the convention hall knew that he was in attendance when he spoke at any of the sessions.

Joe B. Chandler, of Republic Metalware Company, Chicago, said he would be glad to attend a convention every week in the year if it was as full of good feeling and bright ideas as the Sixteenth Annual Convention of Sheet Metal Contractors.

E. C. Anderson, Manager of Furnace Department, The Buck's Stove and Range Company, St. Louis, Missouri, knows a lot about furnaces and is always ready to help the other fellow to solve his problems.

The Lamneck twins, Arthur P. and W. E., renewed old friendships and built up a lot of new ones by their genial manners and happy knack of being really interested in everyone they met.

Mrs. L. Max Baugh, wife of the Secretary of the Traveling Men's Auxiliary, is an enthusiastic worker for her husband's organization. The officers and Entertainment Committee of the Auxiliary freely acknowledge their indebtedness to her in the successful campaign for membership, and presented her with an electric lamp as a token of their appreciation.

Excelsior Steel Furnace Company of Chicago claims the honor of having the youngest delegate at the convention, namely, Ellsworth Glessner, of Peoria, Illinois, who has been only eight months in the trade and only the same length of time on this little old globe we call the earth.

The delegates from St. Louis, numbering with their families sixty-five in all, came to Peoria by boat.

COOPERATION IS CHIEF THEME OF SALESMEN'S AUXILIARY IN MEETING AT PEORIA.

Cooperation in all its phases was the chief theme of the meeting of the Traveling Salesmen's Auxiliary to the Illinois Sheet Metal Contractors' Association, held Tuesday afternoon, June 8, 1920, in Peoria, Illinois. A virile enthusiasm inspired the gathering. The speeches were short, vigorous, and illuminating.

Since its formation a few weeks ago, the Auxiliary has grown in membership to 50, and in earnestness to an extent surpassing the most fervent hopes of its organizers.

The meeting gave proof of the best sort of cooperation in the exchange of ideas and experiences. Everyone present took part in the work of the assembly; everyone said something on the chief theme of the reunion; and everyone pledged himself to do his

R. W. Blanchard, Vice-President Traveling Salesmen's Auxiliary to Illinois Sheet Metal Contractors' Association.

share toward carrying out the purpose of the Auxiliary.

That purpose is briefly set forth in the official statement of the organization as follows: "The object of this Auxiliary is to assist the Illinois Sheet Metal Contractors' Association in enlarging the scope of its activity, to aid in increasing its membership, to bring the salesmen in closer contact with the Association, to work with the Association in the solution of its problems, and to assist in the entertainment features of the Annual Convention."

An entertainment committee was selected to work in conjunction with the officers of the Illinois Sheet Metal Contractors' Association in providing suitable diversion and social attractions for the next annual convention to be held in Decatur, Illinois. The committee consists of the officers of the Auxiliary and five other members as follows:

E. W. NORMAN, President, Indianapolis, Indiana;

R. W. BLANCHARD, Vice-president, Chicago, Illinois;

L. M. BAUGH, Secretary, Galva, Illinois;

GEORGE B. CARR, Treasurer, Chicago, Illinois;

WALTER BIVINS, Chairman of Committee, Decatur, Illinois;

J. B. SAUER, Peoria, Illinois;

ROY E. WILSON, Bloomington, Illinois;

J. C. GREENBURG, Peoria, Illinois;

L. A. DENOYER, Chicago, Illinois.

That the personnel of the foregoing entertainment committee is fairly well representative of the sheet metal and furnace trade is evidenced by the fact that E. W. Norman represents Merchant and Evans; R. W. Blanchard is salesman for Hart and Cooley; Walter Bivins is with the Mahoning Foundry Company; J. B. Sauer is connected with the Meyer Furnace Company; Roy E. Wilson travels for the May-Fieberger Company; J. C. Greenburg sells for the Steelcote Manufacturing Company; and L. A. Denoyer represents the Canton Art Metal Company.

Several sheet metal contractors, prominent in the Illinois Association, briefly addressed the Auxiliary's meeting. George Harms of Peoria and J. C. Neumann of Springfield spoke on good fellowship as the essence of cooperation.

NOTES AND QUERIES.

Coal Oil Gas Burner.

From Joseph A. Zettel and Son, Alexandria, Indiana.

Please advise us who makes coal oil gas burners.

Ans.—Regal Burner Company, 1466 Addison Road, Cleveland, Ohio; Ozaukee Heater Company, Saukville, Wisconsin; Vapor-Gas Burner Company, Columbus, Ohio.

Screw Caps.

From R. H. Gunther, 3154 Avondale Avenue, Chicago, Illinois.

Can you tell me who makes screw caps?

Ans.—William Vogel and Brothers, Incorporated, 37 South Ninth Street, Brooklyn, New York, and 180 North Market Street, Chicago, Illinois; St. Louis Paper Can and Tube Corporation, St. Louis, Missouri, make screw caps.

Oil Heaters.

From E. A. Schmidt, Grand Rapids, Wisconsin.

Where can I purchase oil heaters for hot water range boilers?

Ans.—Cleveland Metal Products Company, 4301 South Western Avenue, Chicago, Illinois.

Oil Burners.

From E. A. Schmidt, Grand Rapids, Wisconsin.

I would like to know who makes oil burners to attach to wood and coal ranges.

Ans.—Ozaukee Heater Company, Saukville, Wisconsin; Vapor-Gas Burner Company, Columbus, Ohio; Regal Burner Company, 1466 Addison Road, Cleveland, Ohio.

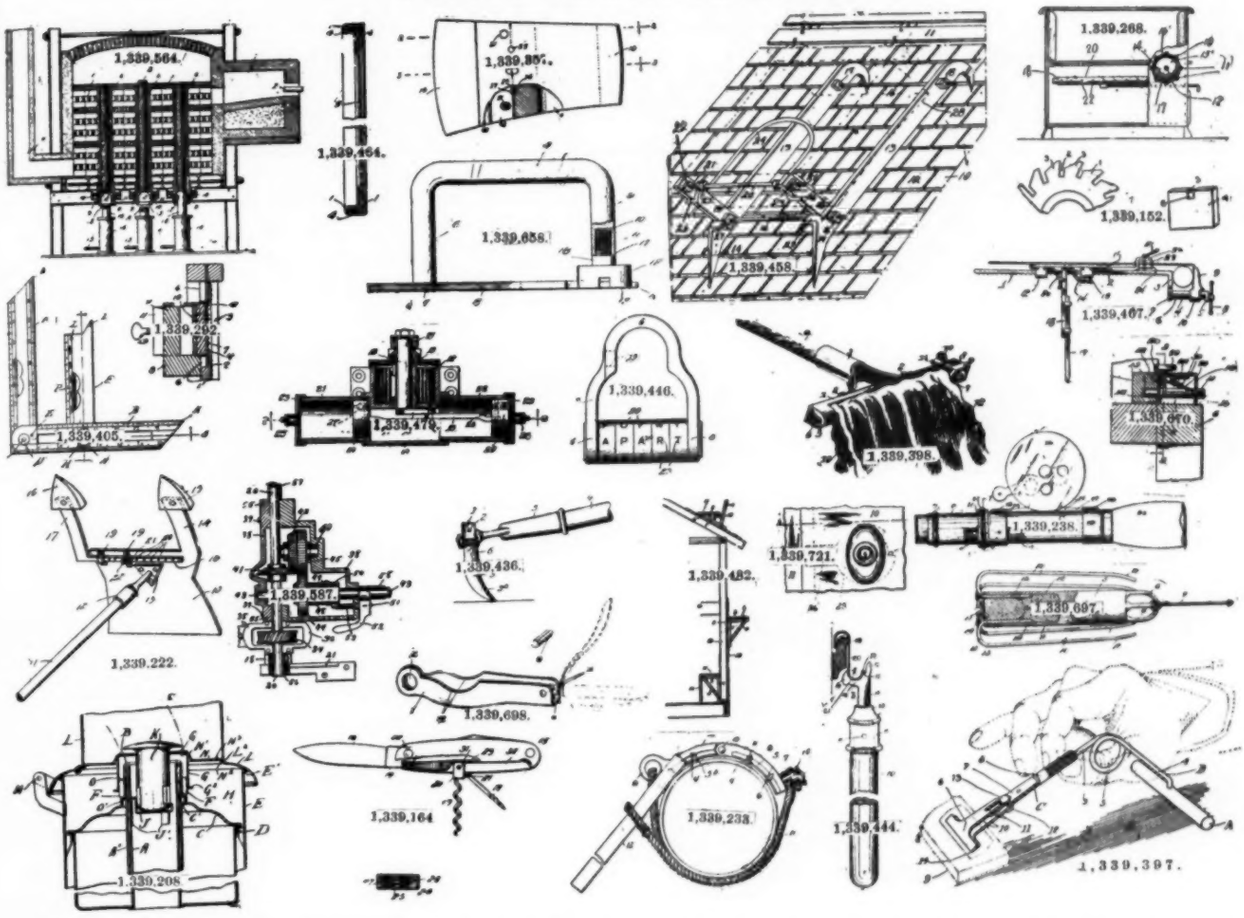
Wire Paper Burners.

From H. D. Gaston, 117½ S. President Street, Jackson, Mississippi.

Kindly advise who manufactures wire paper burners advertised some time ago in AMERICAN ARTISAN AND HARDWARE RECORD.

Ans.—Hart and Cooley Company, New Britain, Connecticut.

NEW PATENTS.



1,339,152. Process of Manufacturing Cutting-Tools. Howard P. Arnold, Rockland, Mass. Filed July 17, 1919.

1,339,164. Pocket Implement. William Rockwell Clough, Alton, N. H. Filed June 28, 1918.

1,339,208. Oil Heating-Stove. Walter C. Lindemann, Milwaukee, Wis., assignor to A. J. Lindemann & Hoverson Company, Milwaukee, Wis. Filed June 19, 1919.

1,339,222. Combination Hoe, Extension-Marker, and Weeder. James R. Randall, Bonnie, Ill. Filed Aug. 19, 1919.

1,339,233. Pipe-Grip. Stewart Stone, Butler, Pa. Filed July 8, 1919.

1,339,238. Reel-Mount. Clarence W. Tillman, New Haven, Conn., assignor to Winchester Repeating Arms Co., New Haven, Conn., a corporation. Filed March 1, 1920.

1,339,268. Stove Attachment. Blaine Lucas, Harlowton, Mont. Filed July 3, 1919.

1,339,292. Washboard. George W. Shoemaker, Dalton, Pa. Filed Feb. 18, 1918.

1,339,357. Ax. Charles Joseph Kopriva, New York, N. Y., assignor to Alois F. Kopriva, Stony Brook, N. Y. Filed Jan. 27, 1919.

1,339,397. Razor-Blade Holder. Charles W. Jones, St. Paul, Minn. Filed Aug. 12, 1918.

1,339,398. Mop-Head. Isaac M. Kaufman, Brooklyn, N. Y. Filed Oct. 10, 1919.

1,339,405. Compound Implement. Frank Meyers, Laurel, Ore. Filed May 1, 1919.

1,339,407. Wire Stretcher. William C. Mitchell, Grandview, Tenn. Filed May 21, 1919.

1,339,436. Rake. Albert I. Conrad, Pasadena, Calif. Filed Dec. 15, 1919.

1,339,444. Picture Hanger and Hook Remover. Manton M. Ferguson, Des Moines, Iowa. Filed Sept. 16, 1918.

1,339,446. Permutation Lock. Antoni B. Fidrocki, Lynn, Mass. Filed Dec. 16, 1919.

1,339,458. Device for Holding Shingles. Jacob Jansma, Hospers, Iowa. Filed May 29, 1919.

1,339,464. Metallic Window Screen. Edward Luft, St. Louis, Mo. Filed Feb. 10, 1919.

1,339,479. Door Check. John C. Schmidt, Chicago, Ill. Filed May 9, 1919.

1,339,482. Scaffold Bracket. Henry O. Sederburg, East Mill Creek, Pa. Filed March 15, 1918.

1,339,564. Furnace. Harry B. Kinnear, Massillon, and Arthur J. Townsend, Canton, Ohio. Filed May 12, 1919.

1,339,587. Driving Mechanism for Power Washing Machines. Herman H. Toll, Clarinda, Iowa, assignor to Clarinda Lawn Mower Company, Clarinda, Iowa, a Corporation of Iowa. Filed Nov. 26, 1917.

1,339,658. File Handle. John E. Lovell, Hastings, Nebr. Filed April 18, 1919.

1,339,670. Sash Lock. Herman Reinl, Secaucus, N. J. Filed Oct. 15, 1919.

1,339,697. Fishing Tackle. Henry England, Chicago, Ill. Filed Nov. 11, 1919.

1,339,698. Combination Tool. John Faix and Samuel Faix, San Francisco, Calif. Filed May 15, 1919.

1,339,721. Lock. John H. Shaw, New Haven, Conn., assignor to Sargent & Company, New Haven, Conn., a Corporation of Connecticut. Filed Jan. 14, 1918.

LACK OF SYSTEM SPELLS RUIN.

When the industrial world is startled by the failure of an old established firm, the reason can usually be found that younger men just from college are not content, as were their fathers, to begin learning the business from the ground floor, and that departments left to superintendents who know of the deficiency of the head and with no one to check their errors fail to keep up the standard of the product or to stop the leaks. Lack of system, waste of energy, friction and want of competent direction will seal the doom of any house.

WEEKLY REPORT OF TRADE AND THE MARKETS

DISPROPORTION BETWEEN FREIGHT MOVEMENT AND STEEL OUTPUT IS RAPIDLY DIMINISHING.

Encouraging reports from the chief steel-making districts indicate that production is nearly normal again and that the disproportion between freight movement and steel output is rapidly diminishing.

New York and New England are receiving more iron and steel than at any time since the strike began and permits for export are again being issued. The output at the Buffalo mills which has been 50 per cent is now between 70 and 75 per cent, but furnace production is not doing as well. Chicago steel plants are operating at 75 per cent capacity and there is a shortage of fuel and steel bars.

In the Mahoning Valley open hearths are operating at 80 per cent of normal, Bessemer are doing better, and about 60 per cent of the blast furnaces are in blast.

STEEL.

A sale of Bessemer sheet bars made this week in Pittsburgh shows that the market has stiffened, a fair sized lot for two or three months' shipment, beginning July 1st, having gone at $75 under regular competitive conditions, when not more than a fortnight ago Bessemer sheet bars were obtainable with little if any difficulty at $70, provided sudden shipment was not required. The market on Bessemer bars is now at $75, for any delivery.

It is a question whether open-hearth sheet bars, formerly quotable at $75 to $80, are any stronger. One could without doubt buy open-hearth bars at $80 and if the delivery were attractive to the mill $75 could probably be done. The Bessemer sale just noted may simply indicate that Bessemer steel is no longer at a discount, and that would not be surprising considering the small number of sellers of Bessemer sheet bars at this time, compared with open-hearth.

COPPER.

Transportation difficulties continue to be the leading factor in the domestic copper market, and although shipments are becoming easier manufacturers, producers and refiners still curtail operations, although some improvement is noted. The outlook on the whole is very encouraging and with normal railroad conditions, heavy buying in copper is looked for with a probable increase in price. Consumers are covered over July and the market is inactive. The leading producers lowered their prices last week.

The reports from Wall Street lately, of an improved demand have found no confirmation in the trade, and as they have no basis, in fact accomplish nothing even in the stock market. The copper market in view of what has occurred in the past few weeks in the speculative metal markets abroad, the strain in credits and finances, and the demoralization in business caused by freight congestion, embargoes, strikes, etc., has made a good showing. Compare the decline in copper with the sensational decline in tin and the declines in other metals, and those who have for months been giving it as their opinion that the copper situation is a sound one have no apologies to make.

While the factors that are so disturbing to business and confidence continue here and abroad, nothing can be expected in the metal other than the steadiness the market is showing in the face of adverse circumstances. But some day things will be more normal, and we believe it will be shown that stocks have been steadily decreasing, and that when the world can begin to buy in anything like the proportion of its requirements, not to speak of the enormous vacuum of requirements that have accumulated abroad, much higher prices will rule.

The only question is how long the needs of Europe can be starved from Europe's inability to finance requirements. The cost of producing copper is not likely to decline much, if any, for a long while, and with an improved demand price must go at least to a figure where producers now working at a loss will be able to get a new dollar for an old one.

Exports so far this month amount to approximately 1,000,000 pounds, while the imports total 2,250,000 pounds of copper bars from South America. May copper sales totaled 62,000,000 pounds, April 101,000,000 pounds, March 320,000,000, as against an average monthly production of only 150,000,000. Total sales for the past month amount to 811,000,000 pounds, and the sales for the past six months have exceeded production by 450,000,000 pounds. Surplus copper stocks on hand today are half of what they were at the beginning of the year.

TIN.

The tin market, both domestic and foreign, declined the past three days of last week when it was thought that the market had finally turned and would continue its rise of the week preceding. The trade in New York and in London is at a loss to account for this continued weakening, as no new factors in the consumption demand or mine and smelter output for this metal have come to light. The contributive factors, in London, however, are money tightness. Japanese resales heavy; receipts of metal, activity of bears and liquidation of bulls that overbought in futures when prices were approximately £160 higher than they are today. Buying has been very

active during the week and larger stocks of tin suitable for delivery on Standard tin accounts has created a spread in price between this brand and Straits of £25. As the market stands today Standard spot has dropped almost £170 in the last three months in London and Straits in America some 16 cents.

In the Chicago market, pig tin has decreased in price from 57 cents to 54 cents a pound, and bar tin from 59 cents to 56 cents a pound.

LEAD.

Improved traffic conditions are having an effect on the domestic lead market and a firmer and stronger tone is generally reported. Inquiries are increasing in volume as consumers gain confidence and the market is expected to become active in the near future. Prompt metal is still scarce and premiums being paid for immediate deliveries, especially in the East. On account of the governmental turnover in Mexico large shipments from that country have been held up.

SOLDER.

Last week's prices continue to rule in the Chicago solder market, as follows: Warranted, 50-50, per 100 pounds, $38.50; Commercial, 45-55, per 100 pounds, $35.80; and Plumbers', per 100 pounds, $33.10.

ZINC.

Generally speaking, the domestic zinc market remains weak and unfavorable, with producers unwilling to book orders for future delivery at existing price, although the bettering of transportation conditions is encouraging to the trade. New York spot is quoted at 8.50, and little to be had at that price, while St.. Louis spot and all positions up to and including August is quoted at 7.60, while September delivery is at 7.65.

Zinc in slabs has advanced in the Chicago market from $8.40 to $8.50 per 100 pounds.

SHEETS.

Advices from Pittsburgh are to the effect that the sheet market is less active than it was, and is in fact distinctly quiet. Nothing more is heard of cancellations, following reports recently of several cancellations on the part of the automobile trade. Following the decline in prompt prices that has been in course for two or three months there is now a little sagging in prices deliveries in the moderately nearby future, such as are offered by the average independent mill, generally about September. It is reported that for such delivery one could probably buy without difficulty on the basis of 5.00 cents for common black, with the possibility of shading this price in occasional instances. The leading interest continues its prices on the basis of 4.35 cents, but it seems to be practically sold out.

Better deliveries of sheets are considered responsible for the easier tone in the market, as production is now averaging between 80 and 90 per cent of absolutely full capacity, with shipments approximately equal to production. Little inroad has yet been made on the large tonnage piled up at mills that were affected by the rail congestion.

TIN PLATE.

The leading interests still have about 1,000,000 boxes of tin plate stored. Efforts of the railroads to furnish better box car supplies to mills for shipping tin plate, have begun to bear some fruit. A general estimate is that shipments of tin plate are equal to about 75 per cent of the capacity, while production the past few days has been running at 50 to 60 per cent of capacity. Of particular interest is the improvement in car supplies at the three large plants on the Pittsburgh and Lake Erie, at Woodlawn, McKeesport and Monessen. At the last named point there were practically no car supplies at all until very recently, but in the past few days Monessen has been able to make fairly heavy shipments. Shipments have been made out of stock, the plant being in enforced idleness on account of inability to get steel. This week there is a partial resumption of production.

The independents are operating better each week, but of the plants seriously affected by the traffic conditions not one is yet in full operation.

OLD METALS.

Wholesale quotations in the Chicago district which may be considered nominal are as follows: Old steel axles, $32.00 to $33.00; old iron axles, $38.00 to $39.00; steel spring, $23.00 to $24.00; No. 1 wrought iron, $26.00 to $26.50; No. 1 cast, $36.00 to $37.00; all net tons. Prices for non-ferrous metals are as follows, per pound: Light copper, 13 cents; light brass, 9 cents; lead, 6½ cents; zinc, 5 cents; cast aluminum, 22½ cents.

PIG IRON.

With the continued improvement in the railroad situation, nearly all consumers of pig iron can now be reached by the furnaces with which they have contracts, although deliveries are slow and somewhat uncertain. The condition is vastly improved over that which existed a month ago, when the rail strike was about a month old. Several of the merchant furnaces that have been accumulating stocks, on account of the traffic situation, are now able to reduce stocks somewhat, but in general a furnace does well if it secures enough cars to ship its current output.

As to price conditions and tendencies, there is very scant probability of any downwad revision. Freight rates and wages are not at all likely to be reduced. The situation regarding costs of coke is far from satisfactory. In fact, all the economic and financial influences which operate as general factors in production and distribution are as strongly at work in the pig iron industry as in any other department of the nation's business activities. Consequently the pig iron market will not undergo any appreciable price recessions during the remainder of the present year. Indeed, some authorities are of the opinion that the peak of the prices has not yet been reached. They argue that the shortage of labor and material can not be overcome for many months.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Basic	$43 00
Southern Fdy. No. 2	46 60
Lake Sup. Charcoal	57 50-60 50
Malleable	43 50

FIRST QUALITY BRIGHT TIN PLATES.

			Per box
IC	14x20	112 sheets	$15 80
IX	14x20		17 75
IXX	14x20		19 45
IXXX	14x20		20 90
IXXXX	14x20		22 15
IC	20x28		31 60
IX	20x28		35 50
IXX	20x28		38 90
IXXX	20x28		41 80
IXXXX	20x28		44 30

COKE PLATES.

Cokes, 180 lbs.		20x28	$19 80
Cokes, 200 lbs.		20x28	20 00
Cokes, 214 lbs.	IC	20x28	20 70
Cokes, 270 lbs.	IX	20x28	24 00

BLUE ANNEALED SHEETS.

No. 10 per 100 lbs.	$5 27
No. 12 per 100 lbs.	5 32
No. 14 per 100 lbs.	5 37
No. 16 per 100 lbs.	5 45

ONE PASS COLD ROLLED BLACK.

No. 18-20 per 100 lbs.	$7 80
No. 22-24 per 100 lbs.	7 85
No. 26 per 100 lbs.	7 90
No. 27 per 100 lbs.	7 95
No. 28 per 100 lbs.	8 00
No. 29 per 100 lbs.	8 10

GALVANIZED.

No. 16 per 100 lbs.	$8 75
No. 18-20 per 100 lbs.	8 90
No. 22-24 per 100 lbs.	9 05
No. 26 per 100 lbs.	9 20
No. 27 per 100 lbs.	9 35
No. 28 per 100 lbs.	9 50
No. 30 per 100 lbs.	10 00

WELLSVILLE POLISHED STEEL.

No. 18-20 per 100 lbs.	$9 65
No. 22-24 per 100 lbs.	9 75
No. 26 per 100 lbs.	9 85
No. 27 per 100 lbs.	9 95

KEYSTONE HAMMERED POLISHED STEEL.

Discontinued. New product will be announced later.

BAR SOLDER

Warranted,

50-50 per 100 lbs. $38 50

Commercial,

45-55 per 100 lbs. 35 80

Plumbers' per 100 lbs. 33 10

ZINC.

In slabs $8 50

SHEET ZINC.

Cask lots 15c

Less than cask lots 15¼-15½c

COPPER.

Copper Sheet, mill base 29½c

LEAD.

American Pig	$ 9 40
Bar	9 65

Sheet.

Full coils	per 100 lbs.	$11 75
Cut coils	per 100 lbs.	12 00

TIN.

Pig tin	54c
Bar tin	56c

HARDWARE

ADZES.

Carpenters'.

Plumbe Net

Coopers'.

Barton's Net

White's Net

Railroad.

Plumbe Net

AMMUNITION.

Shells, Loaded, Peters.

Loaded with Black Powder, Less 18%

Loaded with Smokeless Powder, medium grades, Less 18%

Loaded with Smokeless Powder, high grade, Less 18%

Winchester.

Smokeless Repeater Grade, Less 15%

Smokeless Leader Grade Less 15%

Black Powder Less 15%

U. M. C.

Nitro Club 18%

Arrow 18%

New Club 18%

Gun Wads—per 1000.

Winchester 7-8 gauge	10&7½%
" 9-10 gauge	10&7½%
" 11-28 gauge	10&7½%

Powder	Each
DuPont's Sporting, kegs	$11 25
" " ¼ kegs	3 10
DuPont's Canisters, 1-lb	56
" Smokeless, drums	43 50
" " kegs	22 00
" " ¼ kegs	5 75
" " canisters	1 00
Hercules "E.C." and "Infallible", 50 can drums	43 50
Hercules "E.C.", kegs	22 50
Hercules "E.C.", ½-kegs	11 25
Hercules "Infallible", 25-can drums	22 00
Hercules "Infallible," 10 can drums	9 00
Hercules "E.C.", ¼-kegs	5 75
Hercules "E.C." and "Infallible", canisters	1 00
Hercules W. A. .30 Cal. Rifle, canisters	1 25
Hercules Lightning Rifle, canisters	1 25
Hercules Sharpshooter Rifle, canisters	1 25
Hercules Unique Rifle, canisters	1 50
Hercules Bullseye Revolver, canisters	1 00

ANVILS.

Solid Wrought 23 & 23½ per lb.

ASBESTOS.

Board and Paper, up to 1/16" 17c per lb.

Thicker 18c per lb.

AUGERS.

Boring Machine 40@40&10%

Irwin's 25%

Carpenter's Nut 50%

Hollow.

Bonney's per doz. 30 00

Post Hole.

Iwan's Post Hole and Well 30%

Vaughan's, 4 to 9 in. per doz. $14 00

Ship.

Ford's, with or without screw Net list

AWLS.

Brad.

No. 3 Handled	per doz.	$0 65
No. 1050 Handled	"	1 40
Shouldered, assorted 1 to 4,	per gro.	4 00
Patent asst'd, 1 to 4	"	85

Harness.

Common	"	1 05
Patent	"	1 00

Peg.

Shouldered	"	1 60
Patented	"	75

Scratch.

No. 18, socket handled	per doz.	2 50
No. 344 Goodell-Pratt, List, less		35-40%
No. 7 Stanley	"	2 25

AXES.

First Quality, Single Bitted, 3 to 4 lb., per doz. 16 50

First Quality, Double Bitted per doz. 22 50

Broad.

Plumbs, West, Pat. List

" Can. Pat. $89 00

Firemen's (handled), per doz. 21 00

Single Bitted (without handles). Prices on application

Warren Silver Steel.

Warren Blue Finished "

Double Bitted (without handles).

Warren's Natl. Blue, 3½ to 4½ lb. Prices on application

The above prices on axes of 3 to 4 lbs. are the base prices.

BAGS, PAPER NAIL.

Pounds	10	16	20	25
Per 1,000	$5 00	6 50	7 50	9 00

BALANCES, SPRING.

Sight Spring Net

Straight Net

BARS, CROW.

Pinch or Wedge Point, per cwt. $8 00 to $9 00

BASKETS.

Clothes.

Small Willow	per doz.	15 00
Medium Willow	"	17 00
Large Willow	"	20 00

Galvanized	1 bu.	1½ bu.
Per doz.	$16 08	$18 72

BEATERS.

Carpet.	Per doz.
No. 7 Tinned Spring Wire	$1 10
No. 8 Spring Wire coppered	1 50
No. 9 Preston	1 75

Egg.	Per doz.
No. 50 Imp. Dover	$1 10
No. 102 " " Tinned	1 35
No. 150 " " hotel	2 10
No. 10 Heavy hotel tinned	2 10
No. 13 " " "	3 30
No. 15 " " "	3 60
No. 18 " " "	4 50

Hand	8	9	10	12
Per doz.	$11 50	13 00	14 75	18 00

Moulders'.

12-inch Per doz. 20 00

BELLS.

Call.

3-inch Nickeled Rotary Bell, Bronzed base, per doz. $5 50

Cow.

Kentucky 30%

Door.	Per doz.
New Departure Automatic	$7 50

Rotary.

3 -in. Old Copper Bell	6 00
3 -in. Old Copper Bell, fancy	8 00
3 -in. Nickeled Steel Bell	6 00
3½-in. Nickeled Steel Ball	6 50

Hand.

Hand Bell polished. List plus	15%
White Metal	" 15%
Nickel Plated	" 5%
Swiss	" 10%

Miscellaneous.

Church and School, steel alloys 30%

Farm, lbs.	40	50	75	100
Each	$3 00	3 75	5 50	7 25

BEVELS, TEE.

Stanley's rosewood handle, new list Net

Stanley iron handle Net

BINDING CLOTH.

Zinced	55%
Brass	40%
Brass, plated	60%

BITS.

Auger.

Jennings Pattern	Net
Ford Car	List plus 5%
Ford's Ship	" " 5%
Irwin	35%
Russell Jennings	plus 20%
Clark's Expansive	33⅓%
Steer's " Small list,	$22 00..5%
" " Large "	$26 00..5%
Irwin Car	35%
Ford's Ship Auger pattern Car	List plus 5%

Center 10%

Countersink.

No. 18 Wheeler's	per doz.	$2 25
No. 20 "	"	3 00
American Snailhead	"	1 75
" Rose "	"	2 00
" Flat	"	1 40
Mahew's Flat	"	1 50
" Snail	"	1 90

Dowel.

Russell Jennings plus 20%

Gimlet.

Standard Double Cut	Gross $8 40
Nail Metal Single Cut	Gross $4 00—$5 00

Reamer.

Standard Square	Doz.	2 50
American Octagon	"	2 50

Screw Driver.

No. 1 Common	40
No. 26 Stanley	75

BLACKING, STOVE, (See Polish)

BLADES, SAW.

Butchers'.
Standard, ¾ & 1¼-in.....Nets
Clock Spring..... "
Star ..... "

Hack.
Atkins 5%
Star .....Nets

Wood.
Disston
Nos. 6 66 26
$8 00 $8 50 $8 00
Atkins
Nos. 2 14 18
$3 85 $6 50 $4 75

BLOCKS.

Wooden 20%
Patent 20%

BOARDS.

Stove.
Wabash Crystal.....Net Prices
Wabash Art Inlay.... "
Wabash Embossed.... "

Wash.
No. 760, Banner Globe, (single) .....per doz. $5 25
No. 652, Banner Globe, (single) .....per doz. 6 75
No. 801, Brass King per doz. 8 25
No. 860, Single—Plain Pump 6 25

BOLTS.

Carriage, Machine, etc.
Carriage, cut thread, ¾x6 and sizes smaller and shorter 30%
Carriage, sizes larger and longer than ¾x6 .....20%
Machine, ¾x4 and sizes smaller and rhorter.....35%
Machine, sizes larger and longer than ¾x4.....25%
Stove 50-10%
Tire 40-5%

Mortise, Door.
Gem, iron.....5%
Gem, bronze plated..... 5%

Barrel.
Cast .....Nets
Wrought ..... "
Wrought, bronzed ..... "

Flush.
Wrought ..... "

Spring.
Wrought ..... "
Wrought, heavy..... "

Square.
Wrought ..... "

BORERS.

Angular.
Miller's Falls.....per doz. $23 00
Sill borers, No. 51 " 34 00
" " 52 " 39 50

Bung. Doz.
Enterprise Mfg. Co.'s No. 1..10%
" " " No. 2..10%

BOXES.

Mail, No..... 2 4 10
Per doz....$18 00 23 00 29 00

Mitre.
Stanley's.....Net Prices
Stearns, No. 2...per doz. $30 00

BRACES.

Fray's Genuine Spofford's ..... 20&10%
Fray's No. 08 .....$7 50
" No. 010 ..... 8 00

BRACKETS.

Hay Rack.
Wenzelmann's No. 1, per doz. sets.....$18 00
Wenzelmann's No. 2, per doz. sets..... 19 20

Shelf.
Wrought Steel.....40%

Well.
Oak, Wrought Iron Riveted Top Ears.....per doz. $8 00

BURRS, RIVETING.

Copper Burrs only..25% above list
Tinners' Iron Burrs only.....30%

BUTTS.

Cast Iron.....7½%
Wrought Brass (New List) Plus 5%
Wrought Steel, Bright.....40%
Wrought Steel, Japanned, ...Net Prices

CALIPERS.

Double .....Nets
Inside and Outside..... "
Wing ..... "

CALKS

Logger's Boot.
(Lufkin R. Co.'s), per M..$7 00

Toe.
Blunt and medium, 1 prong, per 100 lbs.....$6 20
Sharp, 1 prong, per 100 lbs 6 70

CANS.

Milk.
Elgin.
Gals..... 5 8 10
Each $4 00 $5 15 $5 15
Iowa Patterns.
Gals..... 5 8 10
Each $4 00 $5 15 $5 15

CAN OPENERS.

See Openers.

CAPS, GUN.

See Ammunition.

CARPET STRETCHERS.

See Stretchers.

CARRIERS.

Hay.
Diamond, Regular...each, Nets
Diamond, Sling..... " "

CARTRIDGES.

See Ammunition.

CASTERS.

Standard—Ball Bearing, ...50&10%
Bed 40%
Common Plate.
Brass Wheel.....15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S, per doz.....$12 25
No. 165S, " 14 01

CEMENT, FURNACE.

American Seal, 5 lb. cans, net $0 45
" " 10 lb. cans, " 90
" " 25 lb.cans, " 1 87
Pecora, 5 lb. cans..... " 45
" 10 lb. cans..... " 90
" 25 lb. cans..... " 1 87

CHAIN AND CHAINS.

Breast Chains.
Doubleslack ....doz. pairs, $3 50
With Covert Snaps " 5 80
With Slide..... " 5 00
Without Slide.... " 4 60

Picture Chains.
Light Brass, 3 ft..per doz. $1 25
Heavy Brass, 3 ft.. " 1 75

Sash Chain. (Morton's)
Steel, per 100 ft.
0..... $2 50
2..... 3 10
1..... 3 60

Champion Metal.
0R..... 5 40
2R..... 5 60
1R..... 7 75

Champion Metal.—Extra Heavy.
1H..... 9 50

Cable Sash Chains.
Steel.....List Net Plus 15%

CHALK, CARPENTERS'.

Blue .....per gro., $1 40
Red ..... " 1 40
White ..... " 1 25
Common White School Crayon ..... " 25c

CHIMNEY TOPS.

In bags.....per bag $1 70

CHECKS, DOOR.

Corbin.....Net List
Russwin..... 20%

CHECKS, DOOR.

Iwan's Volcano.....35%

CHISELS.

Box.
Inches..... 12 14
Round, per doz....$5 25 5 75
Flat, per doz..... 7 25 8 25

Cold.
Good quality, ¾ in. and larger .....Nets
Smaller size, per doz.....Nets

Socket, Firmer.
Ohio.....Price on Application

Socket, Framing.
Ohio.....Price on Application

Tanged, Firmer.—Barton's
With handles.....Net list

Choppers, See **Cutters, Meat.**

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers .....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CHURNS.

Anti-Bent Wood,
Gal..... 5 7 10
Each $3 90 4 60 4 85
Belle, Barrel .....65&7½%
Common Dash,
Gal..... 5 7
Per doz. 17 00 19 00

CLAMPS.

Adjustable.
Martin's 20%
No. 63, Screw.....20%

Cabinet.
Screw 20%

Carpenters'.
Steel Bar...List price plus 25%

Carriage Makers'.
2½" .....per doz. $7 00
5" ..... " 14 00
8" ..... " 28 00
12" ..... " 46 00

Quilt Frame.
No. 30 Ball and Socket, 2¼" head.....per gross $11 25
No. 50, Ball and Socket, 3½" head.....per gross 12 25

Hose.
Sherman's, brass, ¾", per doz. 48c
Double, brass, ¾-in., per doz. 1 20

Saw Filers.
Wentworth's, No. 1, $12.50; No. 2, $13.25; No. 3, $16.25.

CLAWS, TACK.

Wood hdl. No. 10....per doz. $0 95
Forged steel, wood hdle. " 1 75
Solid steel..... " 2 40
Giant ..... " 50

CLEANERS.

Drain.
Iwan's Adjustable.....25%
Iwan's Stationary.....30%

Pot.
Wire .....per doz. $0 75

Side-Walk.
Steel.....per doz., Net prices

CLEAVERS.

Family.
Beatty's,
Inch.... 7 8 9 10
Per doz. $27 00 29 00 33 00 36 00

CLEVISES.

Malleable .....10c lb.

CLIPPERS.

Bolt .....$2 25&6 00

CLIPS.

Axle .....65&5%

Damper.
Standard .....per doz. 70c
Troy ..... " 38c

Hame ..... " 50c

CLOTH.

Emery.
Star .....New Prices
B. & A..... " "

Hardware Wire— Prices on application
Full rolls (100 ft.)
12 Mesh, galvanized "
14 " " "
16 " " "
18 " " "

Screen Wire. Prices on application
12 mesh, painted, per 100 sq. ft..... ....

COLLARS, STOVE PIPE.

Lacquered.
Inches 5 6 7
Fancy pattern, per doz..... 80c 85c $1 15

COMPASSES.

Carpenters' 15%

COPPER—See Metals.

COPPERS—Soldering.

Pointed Roofing.
3 lb. and heavier.....per lb. 37c
2 lb..... " 38c
2½ lb..... " 37c
1½ lb..... " 40c
1 lb..... " 43c

CORD.

Picture.
White Wire.....60&5%

Sash.
Sampson Spot, No. 7, per doz. $24 50
Sampson Spot, No. 7, per doz. $29 40

CORKSCREWS.

Walker's 30%
Williamson's Regular.....35&11%
Williamson's Forged Worm...40%

COTTERS, SPRING.

All sizes.....87½%

COUPLINGS, HOSE.

Brass .....per doz. $2 25

COVERS, WAGON—See Tents.

CRADLES, GRAIN.

Morgan's Grapevine per doz. $45 00

CRAYONS—See Chalk.

CUTTERS.

Glass.
Woodward 40%

Meat.
Enterprise—Nos. 5 10 12
Each.... $2 50 $4 25 $3 75
Nos. 22 32
" 6 50 8 50

Pipe.
Saunders', No. 1 2 3
Each $1 85 2 75 6 75

Slaw and Kraut. Per doz.
4-knife Kraut.....$20 00-55 00
3-knife Kraut, 8x27 in. 13 00-18 00
1-knife Slaw 2 50
2-knife Slaw 3 00

Washer 11 00

DAMPERS, STOVE PIPE.

Ideal
3".....$1 00
4"..... 1 05
5"..... 1 15
6"..... 1 25
7"..... 2 20
8"..... 3 75
10"..... 6 00

DIES AND STOCKS

Discount.....New List

DIGGERS

Post Hole
Eureka.....per doz. $14 50
Iwan's Split Handle (Eureka)
4-ft. Handle..per doz. 15 00
7-ft. " ..per doz. 20 00
Iwan's Perfection (Atlas) per doz 16 50
Iwan's Hercules pattern per doz. 18 00
See also Augers—Post Hole.

Dividers, Wing 25%

DOOR CHECKS—See Checks

DOORS, SCREEN

⅞-in. 4-panel, painted Net Prices
1½-in. 4-panel, painted "
1½-in. 3-panel, natural pine, fancy ..... "

DOOR HANGERS—See Hangers

DRILLS

Blacksmiths' Twist. (New List) 40%

Breast.
Millers Falls No. 12, each $46 00
" " " 112, " 26 00

Hand.
Goodell's Automatic.
Nos. 01 03
Per doz. 12 00 14 40
Goodell's Single Gear, per doz. 15 75
Goodell-Pratt No. 4½ per doz. list, less.....30%
Goodell-Pratt No. 379 per doz. list, less 30%

Reciprocating.
Goodell's.....per doz. 26 00

DRIVERS, SCREW

Standard .....Nets
Lock Ferrule ..... "
Champion ..... "
Champion Pattern ..... "
Clark's Interchangeable ... "
Edison ..... "
Reed's Lightning ..... "
Goodell's Spiral ..... "
Yankee Ratchet ..... "
" Spiral ..... "

EAVES, TROUGH

50% off Standard List.

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform

	Doz.
5-inch	$2 25
6-inch	2 30
7-inch	2 60

Uniform, Collar Adjustable

	Doz.
5-inch	$2 65
6-inch	2 70
7-inch	3 00

ELBOWS—Conductor Pipe.

Galvanized Steel, Tin and Terne, Round Corrugated.

Size.	Doz.
2-inch	50%
3-inch	50%
4-inch	50%
5-inch	50%
6-inch	50%

EMERY, TURKISH.

Out of market at present time.
Domestic, lb. 10c

EYES.

Bright Wire Screw—See Woods, B. W.
Drifting Pick .....60, 10 & 5%
Hooks and Eyes—
Brass, 1½" No. 60, per gross $3 50
Iron, 1½" No. 50, per gross 1 60

FASTENERS, STORM SASH.

Shroeder's.....per doz. $1 50
Sensible..... " 3 00

FILES AND RASPS.

Delta
Delta 30%
Swiss.....List plus 25%
Utility..... " net.

Nicholson's—
American 60%
Arcade 50-10-7½%
Black Diamond.....40-10%
Eagle 50-10-7½%
Great Western 50-10-7½%
Kearney & Foot.....50-10-7½%
McClellan 50-10-7½%
Nicholson brand.....50&7½%
J. Barton Smith.....50&2½%
X-F Swiss Pattern....Net List
Simonds' 50%
Disston's 50%
Heller's .....60&10%

FORKS.

Barley.
Steel, new list.....New Prices

Hay.
2-tine.....New prices
3- " .....New prices
4- " .....New prices
Digging .....New prices
Scoop .....New prices

Header.
3-tine.....New prices
4- " .....New prices

Manure.
4-tine.....New prices

FREEZERS—ICE CREAM

White Mountain 1-quart....@
" " 2 " ....@
" " 4 " ....@
" " 6 " ....@
Arctic..... 1 " ....@
" ..... 2 " ....@
" ..... 4 " ....@
" ..... 6 " ....@

Prices on application

GAUGES.

Cream Pail.
Fairmount..... per doz. $3.75

Marking, Mortise, etc.....
.....Nets

Wire.
Disston's 25%

GIMLETS.

Discount .....35@40%

GLUE.

Bulk.
B Amber.....per lb. 35c
A White..... " 40c
H. S. Amber..... " 32c

Liquid.
Army & Navy.....40%
Le Page's—
List "A".....37½%
List "B".....33⅓%
List "C".....25 %

GREASE, AXLE.

Wood Boxes.
Frazer's .....per gro. $13 00
Hub Lightning 7 50

Wood Pails.
Frazer's, 15lb $1.00; 25lb $1.50 each.
Hub Lightning, 15lb 90c; 25lb $1.21 each.

Tin Cans.
Frazer's
1½ lb. per doz.....$1 75
3 lb. per doz..... 3 25

GRINDSTONES.

Family.

Inches..	7	8	10	12
Per doz.	20 50	21 75	26 25	30 50

Loose.
Per ton.....Price on application

Mounted.

Ball Bearing..	1	2	3
Each	$4 75	5 00	5 25

GUN WADS.

(See Ammunition)

GUNS.

Iver Johnson Champion Single Barrel Shot Guns....Net Prices
Double Barrel, Hammerless ..... "

HAFTS, AWL.

Brad.
Common .....per doz. $0 35

Peg.
Patent, plain top.. " 80
Patent, leather top " 90

Sewing.
Common ..... " 24
Patent ..... " 55

HAMMERS, HANDLED.

each, net.

Blacksmiths, Hand, No. 0, 26 oz. $1 35
Engineers', No. 1, 26 oz..... 1 35
Farriers', No. 6, 7 oz..... 1 41
Machinists', No. 1, 7 oz..... 1 06

Nail.
Vanadium, No. 41½, 16 oz., each $2 00
V. & B., No. 11½, 16 oz., each 1 60
Garden City, No. 111½, 16 oz., each 1 35
Tinner's Riveting, No. 1, 8 oz., each 1 10
Shoe, Steel, No. 1, 13 oz., each 1 00

Tack
Magnetic.
No. 5, each.....$1 00

HAMMERS, HEAVY.

Heavy Hammers and Sledges.
Under 5 lbs.....50%
5 lbs. and over.....50&10%

Masons'.
Single and Double Face....50%

HANDLES.

Auger.
Common Assorted per doz. $0 75
Pratt's Adjustable, Nos. 1 & 2, per doz..... 6 00
Ives' Adjustable...per set, 1 35

Axe 30%

Chisel.
Hickory, Tanged, Firmer, Assorted, 55c; Large, 85c per doz.
Hickory, Socket Firmer, Assorted, 70c; Large size, 80c per doz.

Coal Pick 40%
Drifting Pick 40%
File, assorted, 30c; Large, 35c per doz.

Hammer.
Adze Eye...per doz. 40c to $1 00
Blacksmiths' " 45c@1 00
Machinists' " 50c@1 00

Hay and Manure Fork.....25%

Screw Driver.
Assorted 6
Large 9

Shovel and Spade.....25%

HANGERS.

Barn Door.
U. S. Roller Bearing.....12½%
Matchless 12½%
Warehouse Tandem, No. 44 .....33⅓%

Conductor P.
Iwan's Perfection.....45%

Eave Trough.
All sizes, 5" or smaller. ..... per gross $3 80 Net
All sizes, larger than 5",..... per gross, 5 00 "

Garage Door.
Right Angle .....50&10%
Sliding Folding 50%
Receding 50%

Parlor Door.
Acme .....per set, $3 75
Ives' Improved.... " 3 40
Lane's Standard... " 3 50
Lane's New Model " 3 10
Le Roy Noiseless.....40&10%
Richards 25%
Advance .....40&10%

HASPS.

Hinge, Wrought, ..Add 50% to list
With Staples—See Staples.

HATCHETS.

Crescent 50%
Cast Claw.....per doz. $1 50@1 85
Cast Shingling " 1 50@1 85
Germantown 7½%

HAY KNIVES.

See Knives.

HAY RACK BRACKETS.

Wenzleman's No. 1 ..... per doz. sets, $18 00
Wenzleman's No. 2 ..... per doz. sets, 19 20

HINGES.

Blind.
Clark's Gravity
No. 1.....per doz. sets, $2 25
No. 3..... " " " 5 75

Gate.

Clark's	1	2	3
Hgs & Ltch, dz.	$5 50	7 00	9 75
Hinges only "	4 75	5 50	8 00
Latches only.	1 90	1 90	....

Screen Door.
Cast Iron .....gross $10 00
Steel ..... " 7 00

Spring.
Chicago .....Add 12½% to list
Columbia Dbl. Acting, ... 40&10&5@
Gem 25%
Ideal Detachable, per gro. $11 00
Matchless 40%
New Idea .....per gro. $7 20
Oxford 20%

Wrought Iron.
New Lists .....
Light Strap Hinges.....5&5%
Heavy Strap Hinges...20&7½%
Light T Hinges...List plus 45%
Heavy T Hinges...List plus 45%
Extra Heavy T Hinges.. 15&5%

Screw Hook and Strap.
6 to 12 in.....per 100 lbs. $7 75
14 to 20 in.... " " 7 50
22 to 36 in.... " " 7 25

Screw Hook and Eye.
¾ in.....per doz. pair $2 50
⅝ in..... " " 3 50
½ in..... " " 5 00

HOES.

Garden .....Net

Grub.
Extra .....New prices
Hazel..... per doz. New prices
Ladies' and Boys' ....New prices
Mortar .....New prices
Planter's Eye.....New prices
Weed .....New prices

HOOKS.

Awning. No. 60.....per gro. 50%

Belt.
Brown's .....70&5%
Jones' .....65&5%

Bench.
See Stops, Bench.

Box.
Inch..... 5 7 10 12
Per doz. $2 50 2 75 3 25 3 85

Bush.
Common Axe Handle, per doz. $22 00

Chain.
Inch..¼&5/16 ⅜ 7/16 ½
Pr 100 $7 60-8 10 9 75 11 50 12 60

Clothes Line.
Japanned .....per doz. 48c@1 40
Galvanized.... " 75c@2 50

Coat and Hat.
Common Wire per gro. 1 25-1 65

Conductor.
Iwan's Tinned Sickle.....List

Corn.
Common, riveted, painted red .....per doz. Nets
Little Giant..... " "

Gate.
See Goods, Bright Wire.

Grass.
Common Nos. 1 3 5 7
Per Doz...$4 50 3 50 3 75 3 25

Hammock.
With plate.....per doz. 1 10
With screw..... " 1 00

Lambrequin, or Drapery, per gro.....30c
Picture .....50%&50&10%
Potato and Manure.....Nets

Screw.
Brass 70%
(See Goods, Bright Wire.)
Seat Spring.....per lb. 5½c

HOSE, GARDEN.

Per ft.
Guaranteed 3 ply ¾ inch.....16 c
" 4 ply ¾ inch.....18½c
" 5 ply ¾ inch.....13½c

COTTON COV. RUBBER HOSE.

High Grade Apache 1" guar. press. 400 lbs.....40c

HUSKERS.

Boss.
Nos. ..... B E
Per doz.....New Nets
No. 59.....per doz. New Nets

IRON, PIG.

See Metals.—First column.

IRONS.

Curling.
C.....per doz. $4 40
B..... " 50
A..... " 58
Princess ..... " 1 25
Thelma ..... " 1 25
Pinking ..... " 1 00

Plane.
Wood Bench...Add 10% to list

Sad.
Charcoal .....per doz. $11 00
Common, polished, per 100 lbs. 7 75
No. 70 Asbestos.....$1 50 net
No. 100 " ..... 1 75 net
Common, nickel plated... 8 25
Mrs. Pott's,
No. 50 J, Enterprise, per set Nets
No. 55 J, " " "
No. 50 T, " " "
No. 55 T, " " "
Tailors' Sad.....per lb. "
Tailors' Goose.....per lb. "

Ideal.
6 lb. Household $3 50
9 lb. Dressmakers' 4 25
14 lb. Tailors' Goose..... 5 50

Tuyere.
Single Duck Nest..per doz. $5 25
Double Duck Nest.. " 6 25
Sutton .....each 2 60

JACKS.

Locomotive 30%

Wagon.
Richard's No. 1..per doz. $15 50
Miller 20 00
Oliver,
Nos 0 00
Each $0 60 $0 80
Standard,
Nos. 1 2
Each $0 60 $1 00
R-W
Big Lift.....40%
Tiger 40%

KETTLES.

Brass 15%
Cauldron .....40&5%
Copper .....per lb. 27
Maslin .....40&10%
Sugar 50%

KNIVES.

Beet Topping.
Clyde, 9-in. Scimiter Blade, doz. $3 85
California 3 40

Butcher, Per doz.
Beechwood Handles, 6" blade $4 00
Beechwood Handles, 7" blade 4 65
Beechwood Handles, 8" blade 5 65

Cooper's Hoop.....15%

Corn.
Clipper .....per doz. $1 75
Disston's ..... " 2 75
Earle's ..... " 3 00
Woodford ..... " 2 25

Drawing.
Standard .....List&5%
Adustable 15%
Barton's Carpenters'.....15%

Hay.
Iwan's Solid Socket..doz. $13 00
Heath's ..... " 13 00
Iwan's, Sickle Edge.. " 18 00
Iwan's Impv'd Serrated " 18 00

Hedge.
Challenge .....per doz. $6 00
Disston's ..... " 3 75

Mincing.
Common, Single .. " 60
Common, Double.. " 90
Streeter, 4-blade.. " 1 30
Streeter, 6-blade.. " 2 00

Putty.
Common ....per doz. $0 75@1 50
Lander's ... " 1 75@2 50

Scraping.
Beech Handle..... 90@1 10
Lander's ..... 5 50@6 50

KNOBS.

Doors.
Mineral .....per doz. $1 80
Porcelain ..... " 1 90
Jet ..... " 2 00

LADDERS.

Common Long.
Per ft. .....17c@23c

Extension.
Per ft. ..... 22 to 28

Step.
Common, per ft.....23c
Common, with Shelf, add 10c.
IXL 34c
Challenge, 6 to 9 ft.....55c
10 to 16 ft.....60c

LANTERNS.

Bull's Eye Police.
3-in. Flash Light..per doz. $13 00

LEADERS, CATTLE.

Nos..... 51 52
Per doz.....$1 35 1 45

LEATHER, LACE.

Rawhide ⅜".....100 ft. $2 60
" ½" ..... " 4 40

LEATHERS, PUMP.

Valve and Plunger.....10%

LIFTERS.

Stove Cover.
Coppered ...per gro. $3 25@5 50
Alaska ..... " 8 00
Alaska ..... " 10 00

Transom.
Payson's 55%

LINES.

Chalk.
Twisted in 20-ft. hanks.
Nos. 4 6 7 8 9
Gro.....Prices on Application
Twisted in 50-ft. balls.
Nos. 1 2 3 4
Per doz....Prices on Application
Braided in 20-ft. hanks.
Nos. 0 1 2 3
Per doz...Prices on Application
Mason's... " " "

Clothes.
60-ft. Jute.....per doz. $0 95
60-ft. Sisal..... " 40
50-ft. Cotton..... " 15
50-ft. Braided Cotton ..... " 25

LINING, STOVE.

Bricks.....per crate 42c

LOCKS.

Barn Door.
No. 60 Stearns.....per doz. $10 00
No. 80 " ..... " 17 50

MACHINES.

Riveting.
Stearns No. 1....per doz. $12 00

Tenoning.
No. 50 Peace's Spoke, each $11 50

MAIL BOXES.

See Boxes.

MALLETS.

Carpenters'.
Fibre Head, No. 2 per doz. $16 50
" No. 3 " 19 50
" No. 4 " 28 50
Round Hickory ..... per doz. $3 00— 5 00
Round Lignumvitae.. " 6 25—10 50
Square Hickory " 3 50— 5 50
Square Lignumvitae.. " 8 00—12 00

Tinners'.
Hickory .....per doz. $2 25

MATS.

Door.
National Rigid.....50&10&5%
Acme Steel Flexible.....50%

Stove.
No. 2.....per gro. Nets
No. 1..... " "
No. 1 Asbestos Toasters or wire-covered Stove Mats, with handle.....per doz. 1 10
No. 2 Asbestos Toasters, with ring.....per doz. 60

MATTOCKS.

Plumbs 25%

MAULS.

Iron, lbs..... 10 13 16 18
Per doz...Prices on Application
Wood Face, lb... 10 12 14
Per doz...Prices on Application

Wood Choppers'.
Lake Superior & Oregon pat. .....40&5%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz.....Nets

MILLS, COFFEE.

Enterprise 16 2-3%
Parker .....50&5%
Arcade 40-10%

MITRE BOXES.

See Boxes.

MOPS.

Cotton. Star (Cut Ends).
Pounds 12' 15' 18' 24'-3 oz.
Per doz. $4 50 5 65 6 75 9 00

MOWERS, LAWN.

Gladiator—B. B.
Inches 16 18 20
Each $6 50 7 25 8 00

King Universal—B. B.
Each $5 25 5 75 6 00
Inches 14 16 18

Big Giant.....$3 50 3 90 4 25

NAILS.

Cut Steel....Prices on Application
Cut Iron..... " " "

Wire.
Small Lots, Prices on Application

Cement Coated.
Small Lots, Prices on Application

Horshoe.
Ausable .....55&5%
Capewell 15%
Perfect .....55&5%
Putnam .....20&5%
Star .....30&5%

Picture.
Brass Heads 25%
Brads .....50&5%
Furniture.....List plus 15%

NAIL PULLERS.

See Pullers.

NAIL SETS.

See Sets.

NETTING, POULTRY.

Galvanized before weaving...50%
Galvanized after weaving....45%

NIPPERS.

End Cutting.
Stubb's Pattern, Inches 5 6
Per dozen.....$4 65 6 75

End and Diagonal Cutting.
Swedish Side. Inches 5 6
Per dozen $4 50 5 75

Hoof.
Heller's .....40&10%
V. & B., No. 52, each.....$2 25

NOZZLES.

Hose.
Magic .....per doz. $9 50
Diamond ..... " 5 75

NUTS, HOT PRESSED.

Square Tapped.
$1.85 off per 100 lbs.

Hexagon Tapped.
$1.85 off per 100 lbs.

OILERS

Chase Pattern.
Brass and Copper.....10%
Zinc 33⅓%

Engineers'.
Tin .....per doz. $7 00@ 9 00

Machine.
Common .....per doz. $0 85

OPENERS.

Box.
See Box Chisels.

Can.
Delmonico .....per doz. $1 30
Never Slip..... " 65

Crate.
V. & B.....per doz. $7 25-11 00

OUTFITS, COBBLING.

Combination .....per doz. $16 00
Economy ..... " 8 50
Family ..... " 14 50

PAILS.

Cream.
14-qt. without gauge, ...per doz. $9 50
18-qt. without gauge, ...per doz. 11 00
20-qt., without gauge, ...per doz. 11 75

Sap.
10-qt., IC Tin.....per doz. $4 00
12 " " " ..... " 5 50

Stock.
Galv'd qts. 14 16 18 20
Per doz..$9 75 10 75 12 75 14 50

Water.
Galvanized qts. 10 12 14
Per doz.....$5 75 6 50 7 25

Wood.
Cable, 2-Hoop.....per doz. Nets
Cable, 3-Hoop..... " Nets
Cedar, 3-Hoop, brass " Nets

PANS.

Dripping .....Net

Fry.
Common .....Nets
Acme ..... "

Roasting.
Paxton,
Nos..... 1 2 3 4
Per doz.....Nets
Neverburn ..... "
Savory, No. 200...per doz. $8 40

PAPER.

Building.
Plain .....per 100 lbs. Prices on Application
Tarred ..... "
Tarred Felt.. "
Red Rosin, per ton.....$75 00

Sand and Emery.
No. 1, per ream, best grade $5 40
No. 1, per ream, cheaper grade 4 85

Wrapping.
Express .....100 lbs. Nets

PARERS

Apple.

Goodell's.....per doz. $10 80
Turntable..... " 11 40
White Mountain.... " 8 40
Reading, No. 78.... " 11 40

Potato.

Goodsell's Saratoga, 10½ in., dz. 6 50
Goodsell's Saratoga, 5 in., dz. 5 50

PICKS.

Adze Eye Ore.....22½%
Drifting and Poll Picks.....22½%
Plumbs, Railroad.....22½%
Surface.....22½%

PINCERS.

Carpenters', cast steel.

No.	6	8	10	12
Each	$0.63	.80	1.05	1.15

Blacksmiths'.....45%
Heller's.....40%

PINS.

Clothes.

Common....per box of 5 gro. $0 95

Picket

Fluted, 15-in.....per doz. $1 10
Fluted, 21-in..... " 1 60
Spiral..... " 1 90

PIPE.

Conductor.

Plain Round and Round Corrugated.

29 Gauge.....50%
28 " 40%
26 " 30%
24 " .....List.

Square Corrugated A and B and Octagon.

29 Gauge.....40%
28 " 35%
26 " 25%
24 " .....List.

Galvanized Toncan Metal, Genuine O. H. Iron, Lyonore Metal, Charcoal Iron and Keystone C. B.

Plain Round and Round Corrugated

28 Gauge.....40%
26 " 30%
24 " .....List.

Square Corrugated A and B Polygon and Octagon.

28 Gauge.....35%
26 " 25%
24 " .....List.

14 and 16 oz. Copper, all designs..List.

Portico Elbows.

Galvanized and Terne Steel.

1 -inch.....35%
1½-inch.....35%
1½-inch.....35%
2 -inch.....35%
Tubing.....25%

Discounts on Round apply on sizes 2 inch to 6 inch inclusive.

Freight allowed on 15 dozen or more, to all points where freight rate does not exceed $1.00 per 100 lbs. Less than 15 dozen F. O. B. Factory.

Terms: 30 days net, 2% ten days.

Standard Gauge Conductor Pipe, plain or corrugated.

Not Nested.....35-5%
Nested solid.....40%

Stove.

	Per 100 Joints
29-Gauge, 3-inch	$19 00
" 4-inch	19 50
" 5-inch	20 25
" 6-inch	21 00
" 7-inch	23 00

T-Joint Made-up.

6-inch.....per 100 $60 00

Furnace Pipe.

Double Wall Pipe and Fittings 20%
Single Wall Pipe, Round Pipe Fittings..... 15%
Galvan'd and Black Iron Pipe, Shoes, etc.....15%

PLANES.

Stanley Iron Bench.....net

PLATES, TIN

See Metals in Column 1.

PLIERS.

Giant, Button's—Nets

Cutting.

Bernard's.....New Prices
Lodi.....New Prices
Paragon.....New Prices

Fencing.

Black Bull.....All Nets
Farmers' Choice.....All Nets
Russell's.....All Nets

Flat and Round Nose.

Bernard's.....New Prices
Lodi.....New Prices
Paragon.....New Prices

Tinners'.

Hollow.....Net list
Solid.....each, 10c

PLUMBS AND LEVELS.

Common.....Nets
Cook's.....40%
Davis' Iron.....25%
Davis' Inclinometer.....15%

POINTERS, SPOKE.

Stearns' No. 1.....per doz. $ 8 00
" No. 2..... " 10 00

POKERS, STOVE.

Wr't Steel, str't or bent per doz. $0 75
Nickel Plated, coil hanl's " 1 10

POLISH.

Metal.

Wizard, 6 oz.....per gross $18 00
" ½ pt..... " " 20 40
" 1 pt..... " " 36 00
" 1 qt..... " doz. 6 00
" ½ gal..... " " 10 80
" 1 gal..... " " 18 60

Stove. Per gross

Black Eagle Paste 5 oz.....$13 80
" " " ½ lb..... 17 40
" " " 1 lb..... 31 20
" " " 5 lbs. per case..... 5 25
Black Eagle Liquid, 6 oz. per gross..... 15 60
Black Kid Paste, 5 lbs. per case 6 00
Black Jack Liquid ½ pt. per gross..... 15 60
Black Jack Paste #10 per gross 13 20

FIRE POTS.

Clayton & Lambert's, each $4 00@6 00
Gate City.....each, 6 25
Gem.....each, $6 75@8 50

POWDER.

See Ammunition.

PRESSES, FRUIT AND JELLY.

Enterprise Manufacturing Co....25%

PRIMERS.

See Amunition.

PRUNERS.

Diston's Pole.....per doz. $18 00
Water's Improved..... " 60%

PULLERS.

Cork.

Daisy.....each, $3 10
Phœnix..... " 1 40
Quick and Easy..... " 2 70

Nail.

Giant.....per doz. 14 50
Never-Slip..... " 17 00

PULLEYS.

Awning—Jap'd.....10%

Clothes Line.....10%

Hay Fork.

Iron Wheel, 5-in.....per doz. 2 50
Wood Wheel, 6-in..... " 2 65
Wood Wheel, 6-in., pass knot, ...per doz. 3 00

Sash.

Common.....Net
Common-Sense, 2-in.....Net
Empire Pattern, 2-in.....Net
Ideal.....Net
Steel.....Net

PUMPS.

Pitcher Spout.

Nos.	1	2	3	4
Each				Nets

Spray.

Midget Junior..... per doz. 3 75
New Misty..... " 6 00
Crescent..... " 6 50

PUNCHES.

Conductors.

No. 22.....per doz. $3 00
Machine.....per lb. 25

Saddlers'.

Common.....per doz. 1 50 to 5 00

Revolving Spring.

Stearns, No. 10.....per doz. $ 6 25
" No. 40..... " 12 00
" No. 60..... " 16 00

PUTTY.

Strictly pure.....per 100 lbs. $4 25

RAIL.

Barb Door.

Matchless, 1-in..... 5c
Matchless, 1½-in..... 7c
Storm King..... 5c

Sliding Door.

Bronzed wrought iron...per ft. 8½c

RAKES.

Garden.	Per doz.
Steel, Bow, 12-inch Teeth	$8 50
Steel, Bow, 14-inch "	9 25
Malleable Iron, 12-in. "	4 75
Malleable Iron, 14-in. "	5 00

Hay.

Wood, 10 Teeth.....$4 00

Lawn.

20 Teeth.....per doz. $5 50

RASPS—See Files.

RAZORS—SAFETY.

Gillette.....per doz. $45 00
Auto Strop..... " 45 00
Gem..... " 8 40
Gem (3 doz. lots)..... " 8 00
Ever Ready..... " 8 40
Ever Ready (3 doz. lots) " 8 00

RAZOR STROPS.

Star (Honing).....50%

REGISTERS.

Cast Iron.....10%
Steel and Semi-Steel.....20%
Solid Brass or Bronze Metal prices on application.....
Baseboard.....20%
Adjustable Ceiling Ventilators...20%

REGISTER FACES.

Japanned, Bronzed and Plated.

4x6 to 14x14.....20%
14x14 to 38x42.....40%

REVOLVERS.

Iver Johnson Safety Automatic Hammer..... New Nets
Hammerless..... "
I. J. Model 1900..... "

RINGS AND RINGERS.

Bull.

Copper	2½-in.	3-in.
Per doz.	$2 40	$2 65

Rea's Improved Self-Piercing copper, doz. 3 40
Steel, per doz..... 1 50 1 80

Hog.

Blair's Rings.....per doz. $ 75
Blair's Ringers..... " 1 00
Brown's Rings..... " 72
Brown's Ringers..... " 1 00
Hill's Ringers..... " 1 00
Hill's Ring, boxes.... " 72
Major Rings..... " 60
Perfect Ringers..... " 1 50
Wolverine Rings..... " 1 65
Wolverine Ringers... " 1 10

Fruit Jar.

White.....per lb.....30c

Key.

Split, round.....per doz. $0 17
Split, square..... " 32
Ball, round..... " 40

RIVETS.

Copper Belt.....Add 15% to list
Coppered Iron.....30%
Tinners'.....30%
Hame.....per lb. $0 17
Slotted Clinch.....per doz. 60c@1 10

Tubular.

Nos. 1 and 2 assorted sizes, 50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes, 10 in box.....doz. 1 40

RIVET SETS.

See Sets.

ROPE.

Cotton.

¼, 5-16 in. Com. on reels, per lb....85c
¼, 5-16 in. Com. in coils. " ...85c

Sisal

1st Quality.....19½c
No. 2.....17½c

Pure Manila.

1st Quality, base.....per lb. 28½c
Hardware Grade.....per lb. 27½c

RULES.

Prices on application

Lufkin's Hickory Board..... "
Lufkin's Log..... "
Lufkin's Boxwood..... "
Lufkin's Zigzag..... "

SAWS.

Band.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Buck.

Disston's.....Prices on applic'n
Jackson's..... New nets

Butchers'.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Circular.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n
Hiles'..... New nets

Compass.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Coping.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Cross-Cut.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Dehorning.

Disston's.....Prices on applic'n

Flooring.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Hack.

Disston's.....Prices on applic'n

Hand and Rip.

E. C. Atkins & Co. Prices on applic'n
Disston's No. 7...Prices on applic'n
Disston's Nos. 8, D8, 12, 76, 112, D100, and 120..Prices on applic'n
Keystone..... New nets

Keyhole.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Miter Box.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Panel.

E. C. Atkins & Co. Prices on applic'n
Disston's No. 7...Prices on applic'n

Patternmakers'.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Pruning.

Disston's.....Prices on applic'n

Stairbuilders'.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

Wood.

E. C. Atkins & Co. Prices on applic'n
Disston's.....Prices on applic'n

SAW BUCKS—See Bucks.

SAW SETS—See Sets

SAW TOOLS—See Tools.

SAW FRAMES.

Common, plain.....per doz. $1 50
Common painted.... " 2 10

SCALES.

Counter.

Pelouze.....40&10%

SCISSORS.

Star.....60%

SCOOPS.

Grain.

½ bu. "Hercules"....per doz. 3 70
1-bu. "Hercules"..... " 5 00

SCRAPERS.

Box.

Triangular, No. 6....per doz. $6 25

Road.

Cubic ft.	7	5	3
With runners, ea.	$7 00	6 50	6 20

SCREEN DOOR HINGES.

Cast iron.....gross, $13 00
Steel..... " 9 50

SCREWS.

Bench.

Iron, ins.	1	1½	1	1½
	$6 82	7 87	9 45	16 80

Wood, white maple...per doz. 6 00
Hand—Wood.....50%
Hand Rail.....22½%
Jack.....20%
Lag or Coach—all sizes, gimlet pointed.....45-5%

Saw—Centennial,

Nos.	1	2	3	4
Per doz.	47c	55c	75c	90c

Wood.

F. H. Bright.....70-10-10%
R. H. Blued.....65-10-10%
F. H. Jap'd.....62½-10%
F. H. Brass.....60&15%
R. H. Brass.....57½&15%
R. H. Nickel Plated.....57½-10%

SCYTHES.

Clipper, Grass.....per doz. $13 50
Honest Dutchman.... " 13 70

SETS.

Nail.
Square head..... per doz. $1 25
Cup point, knurled.. " 1 15

Rivet.
Farmers'.....per doz. $2 10
Tinners'.....25%

Saw.
Aiken's Pattern.....per doz. $6 50
Disston's Monarch... " 7 20
Disston's X-Cut..... " 13 50
Leach's..... " 80
Nash's Hand..... " 3 15
Nash's X-Cut..... " 4 20
Stillman's Lever..... " 1 30
Stillman's X-Cut..... " 2 50
Whiting Pattern, No. 21 " 5 75
Eccentric Anvil, Hand, No. 395, N. P. Morrill Pattern, ...per doz. 11 50

SHARPENERS, SKATE.

Diamond.....per doz. $1 60
Perfect.....1 20

SHEARS.

		Per Doz.
Nickel Plated, Straight,	6"....	$12 90
" " "	7"....	14 85
" " "	8"....	16 30
Japanned, Straight	6"....	11 00
" "	7"....	12 40
" "	8"....	13 80

Tinners'—See Snips.

SHEAVES, SLIDING DOOR.

Common.

Inches....	3	4	5
Per set.....	$1 40	1 75	2 40

Hatfield's.
Per set....$1 80 2 10 2 75 25

SHELLS—See Ammunition.

SHELLERS, CORN.

Union.....per doz. $6 75

SHIELDS.

Expansion Bolt Shields.....60%

SHOES.

***Conductor*.....60%**

SHOT—See Ammunition.

SHOVELS AND SPADES.

Coal.
No. 2, Woodford.....per doz. $5 50
No. 182..... " 6 00
Ames', new list.....Discount, 12½%

	Per doz.
Neverbreak, hollow bck, blk....	Nets
National... " " ...	"
Buckeye... " " ...	"
Mohawk... " " ...	"

Bar Drain & Ditching
Iwan's Perfection.....$30 00
Railroad, etc.

	Net
Black Diamond.....per doz.	
Crescent..... "	"
Keystone..... "	"
Star..... "	"
Hollow Back..... "	"

Ames', new list.....Discount, 12½%
Snow.
Galvanized, with wood handle, No. 56.....$1 45
No. 55..... 1 55
Alaska Steel.
D-Handle.....per doz. $3 50
Long Handle..... " 3 00

SINKS.

Cast Iron.
Painted, 16x24..... Net
Enameled, White, 16x24..... "
Wrought Steel.
Painted, 16x24..... "

SLEDGES—See Hammers.

SNAPS, HARNESS.

Covered Spring.....Add 30%
Judd's Pattern.....Add 33⅓% to list

SNATHS.

Double Ring, Bush.....per doz. $9 75
Patent Loop, Bush..... " 10 00
Patent Loop, Grass.... " 8 75

SNIPS, TINNERS'.

Clover Leaf.....40&10%
National.....40&10%
Star.....50%

SOLDER—See Metals.

SPRINGS, DOOR.

Perfect.

Nos.....	2	3	4	5	6	7
Per doz..	55c	60c	65c	75c	90c	1 00

Reliance.

	Light	Medium	Heavy
Per doz..	$1 55	2 10	3 20

Torrey's.....per doz. 1 65

SPRINKLERS, LAWN.

Stearns' No. 1.....per doz. $9 75

SQUARES.

Steel and Iron.....Nets new list (Add, for bluing, $3.00 per doz., net.)
Mitre.....
Try..... Nets
Try and Bevel.....
Try and Miter.....
Fox's.....per doz. $6 00
Winterbottom's.....10%

SQUEEZERS, LEMON.

Common Wood.....per doz. $0 70
Porcelain Lined, Wood. " 1 25
Boss, malleable iron.... " 1 20
Iron frame, porc'n bowl " 1 90
Iron Frame, glass bowl.. " 2 35
Little Giant, tin'd iron.. " 4 00
Drum, japanned..... " 3 60
Drum, nickel plated.... " 4 50

STAPLES.

Blind.
Barbed.....per lb. 21@22c
Butter Tub..... " 16@19c
Fence—
Polished.....per 100 lbs. $5 45
Galvanized..... " 6 15
Netting.
Galvanized.....per 100 lbs. 6 50
Wrought.
Wrought Staples, Hasps and Staples, Hasps, Hooks and Staples, and Hooks and Staples.....50&10%
Extra heavy.....35%

STEELYARD.

Discount 25%.

STONES.

Axe.

Hindostan.....per lb.	New	Nets
More Grit..... "	"	
Washita..... "	"	

Emery.
No. 126.....per doz. New Nets
Oil—Mounted.
Arkansas Hard No. 7 per doz. New Nets
Arkansas Soft..... " "
Washita No. 717... " "
Oil—Unmounted.

Arkansas Hard....per lb.	New	Nets
Arkansas Soft..... "	"	
Lily White..... "	"	
Queer Creek..... "	"	
Washita..... "	"	

Scythe.

Black Diamond....per gro.	New	Nets
Crescent..... "	"	
Green Mountain. "	"	
LaMoille..... "	"	
Extra Quinnebog. "	"	
Red End..... "	"	

STOPS, BENCH.

No. 10 Morrill pattern, per doz. $10 00
No. 11 Stearns " " 8 75
No. 15 Smith " " 6 50

STOPPERS, FLUE.

Common.....per doz. $1 10
Gem, flat, No. 3..... " 1 00
Gem, No. 1..... " 1 10

STOVE PIPE—See pipe.

STOVE BOARDS—See Boards.

STOVE POLISH—See Polish.

STRAPS.

Skate.....per doz. 85c & 1 20

STRETCHERS.

Carpet.
Bullard's.....per doz. $3 90
Excelsior..... " 5 25
Malleable Iron..... " 70
Perfection..... " 6 30
King..... " 4 50
Wire.
O. S. Elwood, No. 1...per doz. Nets
O. S. Elwood, No. 2.. " "

SWIVELS.

Malleable Iron.....per lb. $0 10
Wrought Steel.....per gro. 4 50

TACKS.

Bill Posters' 6-oz., 25 lb. boxes, per lb..... 15c
Upholsters' 6-oz., 25-lb. boxes, per lb..... 15½c

TAPES, MEASURING.

Asses' Skin..... List&40%
Lufkin's Steel.....Prices on applic'n
Lufkin's Metallic...Prices on applic'n
Lufkin's Pocket.....Prices on applic'n

THERMOMETERS.

Tin Case.....per doz. 80c@$ 1 25
Wood Back... " $2 00@ 12 00
Glass..... " 12 00

TIES.

Bale.
Single Loop, carload lots.....75&7%
" " less than car lots 70&15%
Cow—See "Chains."

TOOLS, SAW.

Disston's Universal.....40%

TRAPS.

Game with Chains.	Per doz.
Victor No. 1.....	$2 01
Oneida Jump No. 1.....	2 75
Newhouse No. 1.....	5 62

Mouse and Rat.	Net per gross
Out O'Sight Mouse.....	$ 8 00
" " Rat.....	15 00
" " Mole.....	100 00
#44 Pocket Gopher.....	20 00
Victor Mouse.....	2 60
Hold Fast Mouse.....	2 60
Victor Rat.....	11 30
Hold Fast Rat.....	11 00
Official Rat.....	13 50
Wood Choker Mouse, 4 Holes	11 00

TROWELS.

Brick.
Clover Leaf.....30%
Brade's.....15&5%
Disston's.....30%
Rose's.....Net
Plasterers'.
Clover Leaf.....40%
Disston's.....25%
W. & McP.....Net

TRUCKS.

Bag.....each, $3 75
Warehouse or store.
No 1, each.....$24 50
" 2, " 22 50

TUBS, WASH.

Standard, Wood,				Ex.
Nos.....	3	2	1	large
Per doz..	$9 50	11 25	12 75	15 50

Galvanized.			
No.....	1	2	3
Per doz.....	13 75	15 95	18 60

TWINE.

	Market Quotation
3-ply Cotton Wrapping.....	
4 " "	
4 Extra Wrapping.....	
4 " Hvy. Wrapping..	
4 " Wrapping on tubes...	
3 " " cones...	
4 " " " ...	
India Hemp, ½-lb. balls, No. 18..	
2-ply Jute, 1-lb. balls.....	

Seins.	Market
Soft.....per lb	Quotation
Med..... "	"
Hard..... "	"
Staging, ½-lb. ball, size 21.....	"
" " " 24.....	"
" " " 27.....	"
Bagging, ½-lb ball.....	"
3-ply, "B" in hanks.....	"
4- " "B" "	"
3- " "A" "	"
3- " Silver Finish, in hanks...	"

Fodder or Lath.
130 strand.....

VISES.

No. 21, Hand..... $5 00

Oval Slide, Inches	2	2½	3	3½	4½
Each	$2.40	$2.60	$3.00	$3.75	$7.75

No. 1, Genuine Wentworth, Noiseless Saw.....per doz. 13 50
No. 2, Genuine Wentworth, Noiseless Saw.....per doz. 20 00
No. 3, Genuine Wentworth, Noiseless Saw.....per doz. 18 00
No. 500, All Steel Folding Saw .....per doz. 13 50

WARE.

Glue Pots.
Tinned.....Add 15% to list
Enameled.....30%

WASH BOARDS—See Boards.

WASHERS.

Standard O. G. cast iron...per lb. 3½c
Wrought steel in 5-lb. boxes, per lb.:

In.	3/16	¼	5/16	⅜	½	⅝	¾	1
	18c	16c	15c	13c	12c	11½c	11c	11c	11c

WEDGES.

***Ax*.....per doz. Nets**
***Galling*.....per lb. "**
***Saw*..... " 8½**

WEANERS.

Calf.
Fuller's, per doz.....$2 00 to $2 50
Tyler's Safety, per doz. 1 85 to 2 40
Carroll's, per doz.... 3 00 to 3 75
Hoosier, per doz..... 3 50 to 4 60
Shaw Perfected..... 3 00 to 3 75

WEIGHTS.

***Hitching*.....per lb. Nets**
Sash—f.o.b. Chicago
Ton lots, per ton.....$60 00
Smaller lots, per ton..... 63 00

WHEEL BARROWS.

No. 4 Tubular Steel.....@ $9 25
Common Tray or Stave Tray @ 4 00
Angle leg, garden..... @ 6 50

WHEELS.

***Carborundum*.....50%**
***Emery*.....60%**

***Well.* Ins.....**	8	10	12
Per doz.....	$5 50	7 25	8 50

12 in. heavy hoisting, per doz. $25 00

WIRE.

Bras.
In coils.....Nets
In 1-lb. spools, new list.....Nets
Broom—Tinned.....Nets
Cable—Same price as Barbed Wire.

Copper.
In coils.....Nets
1-lb. spools, new list.....Nets
Fence—Smooth. An'eal'd Gal.v'd
Nos. 6 to 9, less than car, per 100 lbs....$4 25 $4 95
Hair—New List.....40&10%

Market.	Market Quotations
Bright, full bdles.....	"
Bright, broken bdles.....	"
Coppered, full bdles.....	"
Coppered, broken bdles.....	"
Tinned, full bdles.....	"
Tinned, broken bdles.....	"

Picture—In coils.....80%@80&10%
In 5-lb. spools.....per lb.....26c

WRENCHES.

Coes Steel Handle,	6 inch.....	30%
" " "	8 "	30%
" " "	10 "	30%
" " "	12 "	30%
Coes Knife-Handle,	6 "	30%
" " "	8 "	30%
" " "	10 "	30%
" " "	12 "	30%
Coes All Patterns.....		30%

Bemis & Call's:
Adjustable S, 10%; Adjustable S Pipe, 10%; Briggs' Pattern, 25%
Combination Bright.....10%
Steel Handle Nut.....25%
Combination Black.....25&5%
Merrick Pattern.....25&5%

Knife Handle Pattern.
No. 62, Screw Wrench. List, plus 5%
No. 60, Steel Handle.

WRINGERS.

No. 790, Guarantee....per doz.		$67 00
No. 770, Bicycle.....	"	62 50
No. 110, Domestic....	"	55 50
No. 110, Brighton.....	"	51 00
No. 740, Bicycle.....	"	62 50
No. 22, Domestic....	"	55 50
No. 22, Pioneer.....	"	51 00
No. 770B, Bicycle.....	"	101 00
No. 781B Guarantee...	"	111 00

ADVERTISERS' INDEX

ALPHABETICAL LIST

Allen & Co., Inc., L. B..... 76
American Sheet & Tin Plate Co..... 74
American Steel & Wire Co..... 82
Ashton Mfg. Co..... 77
Basman Co., Inc., A. M..... 74
Berger Brothers Co..... 76
Berns Otto..... 77
Bertsch & Co..... 78
Brier Hill Steel Co..... 76
Bullard & Gormley Co..... 83
Burgess Soldering Furnace Co..... 77
Burton Co., W. J..... 74
Caldwell Mfg. Co..... 82
Central Heating & Supply Co..... 15
Central Pattern Co..... 23
Clark-Smith Hardware Co..... 76
Clayton & Lambert Mfg. Co..... 77
Cleveland & Buffalo Transit Co..... 76
Cleveland Castings & Pattern Co..... 23
Coes Wrench Co..... 80
Coleman, Allan J..... 81
Co-operative Foundry Co..... 4
Cope-Swift Co., Inc..... 23
Cortright Metal Roofing Co..... 77
Danville Stove & Mfg. Co..... 12
Dieckmann Co., Ferdinand..... 72
Dover Wood Face & Lbr. Co..... 18
Dreis & Krump Mfg. Co..... 79
Enterprise Mfg. Co. of Pa..... 80
Forest City Fdy. & Mfg. Co..... 13
Friedley-Voshardt Co..... 74
Globe Stove & Range Co..... 1
Hall-Neal Furnace Co..... 18
Hammond Heating Co..... 18
Harrington & King Perforating Co.. 77
Hart & Cooley Co..... 7
Haynes-Langenberg Mfg. Co..... 5
Heller Bros. Co..... 82
Hemp & Co..... 78
Henry Furnace & Fdy. Co..... 11
Hess-Snyder Co..... 17
Hessler Co., H. E..... 74
Howes Co., S. M..... 23
Hussey & Co., C. G..... 74
Hyfield Mfg. Co..... 81
Independent Reg. & Mfg. Co..... 21
Inland Steel Co..... 73
Jack Corp., A. W..... 23
Kimball Bros. Co..... 71
Kirk-Latty Mfg. Co..... 23
Knoedler, Frederick J..... 78
Lalance & Grosjean Mfg. Co..... 81
Lamneck Co., The W. E..... 9
Lufkin Rule Co..... 82
Lupton's Sons Co., David..... 75
Mahoning Foundry Co..... 14
May-Fiebeger Furnace Co..... 16
Merchant & Evans Co..... 74
Meyer & Bro. Co., F..... 8
Meyer Furnace Co..... 3
Michigan Safety Furnace Pipe Co.... 19
Milwaukee Corrugating Co..... 84
Modern Way Furnace Co..... 16
Monroe Fdy. & Furnace Co..... 17
Niagara Machine & Tool Works.... 78
Northwestern Stove Repair Co..... 23
Peck, H. E..... 71
Peerless Foundry Co..... 17
Pittsburgh Steel Co..... 81
Quincy Pattern Co..... 23
Rock Island Mfg. Co..... 82
Rock Island Register Co..... 21
Roesch, Geo. E..... 71
Rybolt Heater Co..... 16
Ryerson & Son, Joseph T..... 24
Safety Interlocking Stove Pipe Co... 23
Schill Bros. Co..... 15
Schwab & Sons Co., R. J..... 2
Special Chemicals Co..... 75
Standard Furnace & Supply Co..... 14
Standard Ventilator Co..... 77
Stearns Register Co..... 20
St. Louis Technical Institute..... 71
Sullivan-Geiger Co..... 71
Sykes Co., The..... 77
Tubular Heat. & Vent. Co..... 18
Turner Brass Works..... 77
Tuttle & Bailey Mfg. Co..... 21
XXth Century Heat. & Vent. Co.... 16
Union Steel Products Co..... 82
Vaughan & Bushnell Mfg. Co..... 80
Vedder Pattern Works..... 23
Victor Stove Co..... 18
Viking Shear Co..... 78
Walworth Run Fdy. Co..... 10
Whitney Mfg. Co., W. A..... 78
Whitney Metal Tool Co..... 78
Wise Furnace Co..... 6

CLASSIFIED INDEX

Asbestos Sheets.
Central Heating Supply Co., Chicago, Ill.
Jack Corporation, A. W., Lockport, New York

Bale Ties.
American Steel & Wire Co., Chicago, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

Bolts and Nuts.
Ryerson & Son, Joseph T., Chicago, Ill.

Bolts—Stove.
Kirk-Latty Mfg. Co., Cleveland, Ohio

Brakes—Cornice.
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Niagara Machine & Tool Works, Buffalo, N. Y.

Brass and Copper.
Hussey & Co., C. G., Pittsburgh, Pa.
Merchant & Evans Co., Philadelphia, Pa.

Ceiling—Metal.
Burton Co., W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Chain—Furnace.
Central Heating Supply Co., Chicago, Ill.

Chisels.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Closet Cleaners.
Coleman, Allan J., Chicago, Ill.

Coal Chutes.
Peerless Foundry Co., Indianapolis, Ind.

Cornices.
Burton Co., W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Cut-Offs—Rain Water.
Sullivan-Geiger Co., Indianapolis, Ind.

Dampers.
Howes Co., The S. M., Boston, Mass.

Doors—Fire.
Merchant & Evans Co., Philadelphia, Pa.

Eaves Trough.
Berger Bros. Co., Philadelphia, Pa.
Burton Co., W. J., Detroit, Mich.
Clark-Smith Hardware Co., Peoria, Ill.
Milwaukee Corrugating Co., Milwaukee, Wis.

Elbows & Shoes—Conductor.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.

Elevators.
Kimball Bros. Co., Council Bluffs, Iowa

Enamel—Iron.
Black Silk Stove Polish Works, Sterling, Ill.

Enamelware.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Fence Gates.
American Steel & Wire Co., Chicago, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

Fencing—Wire.
Pittsburgh Steel Co., Pittsburgh, Pa.

Files.
Heller Bros. Co., Newark, N. J.

Flux—Aluminum.
Roesch, Geo. E., Aurora, Ill.

Flux—Soldering.
Allen Co., Inc., L. B., Chicago, Ill.

Furnace Rings.
Walworth Run Fdy. Co., Cleveland, Ohio

Furnaces—Soldering.
Ashton Mfg. Co., Newark, N. J.
Berns, Otto, Newark, N. J.
Burgess Soldering Furnace Co., Columbus, Ohio
Clayton & Lambert Mfg. Co., Detroit, Mich.
Turner Brass Works, Sycamore, Ill.

Grates—Camp.
Union Steel Products Co., Albion, Mich.

Hammers.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Heaters—School Room.
Globe Stove & Range Co., Kokomo, Ind.
Hammond Heating Co., Cincinnati, Ohio
Meyer Furnace Co., Peoria, Ill.
Monroe Fdry. & Furnace Co., Monroe, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Standard Furnace & Supply Co., Omaha, Neb.

Heaters—Warm Air.
Central Heating Supply Co., Chicago, Ill.
Co-operative Fdy. Co., Rochester, N. Y.
Danville Stove & Mfg. Co., Danville, Pa.
Forest City Fdy. & Mfg. Co., Cleveland, Ohio
Globe Stove & Range Co., Kokomo, Ind.
Hall-Neal Furnace Co., Indianapolis, Ind.
Hammond Heating Co., Cincinnati, Ohio
Haynes-Langenberg Mfg. Co., St. Louis, Mo.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess-Snyder Co., Massillon, Ohio
Mahoning Foundry Co., Youngstown, Ohio
May-Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., Peoria, Ill.
Modern Way Furnace Co., Fort Wayne, Ind.
Monroe Fdy. & Furnace Co., Monroe, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Rybolt Heater Co., Ashland, Ohio
Schill Bros. Co., Crestline, Ohio
Schwab & Sons Co., R. J., Milwaukee, Wis.
Standard Furnace & Supply Co., Omaha, Neb.
Tubular Heating & Ventilating Co., Philadelphia, Pa.
XXth Century Heating & Ventilating Co., Akron, Ohio
Victor Stove Co., Salem, Ohio
Wise Furnace Co., Akron, Ohio

Holders—Flag Pole.
Enterprise Mfg. Co. of Pa., Philadelphia, Pa.

Horse Shoes.
American Steel & Wire Co., Chicago, Ill

Jobbers—Hardware.
Bullard & Gormley Co., Chicago, Ill
Clark-Smith Hdw. Co., Peoria, Ill

Kitchen Utensils.
Lalance & Grosjean Mfg. Co., Chicago, Ill.

Lath—Expanded Metal.
Milwaukee Corrugating Co., Milwaukee, Wis

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind.
Niagara Machine & Tool Wks., Buffalo, N. Y.

Machines—Razor Blades.
Hyfield Mfg. Co., New York, N. Y.

Machines—Stove Pipe.
Hemp & Co., St. Louis, Mo.

Machines—Tinsmith.
Bertsch & Co., Cambridge City, Ind
Dreis & Krump Mfg. Co., Chicago, Ill.
Hemp & Co., St. Louis, Mo.
Knoedler, Frederick J., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.

Metal—Babbitt.
Merchant & Evans Co., Philadelphia, Pa.

Meat & Food Choppers.
Enterprise Mfg. Co. of Pa., Philadelphia, Pa.

Metals—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Millboard.
Jack Corporation, A. W., Lockport, N. Y.

Miters.
Friedley-Voshardt Co., Chicago, Ill.

Nails—Slating.
Hussey & Co., C. G., Pittsburgh, Pa.

Nails—Wire.
American Steel & Wire Co., Chicago, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

Nut Crackers.
Enterprise Mfg. Co. of Pa., Philadelphia, Pa.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.

Patterns—Furnace.
Central Pattern Co., Quincy, Ill.

Patterns—Machinery.
Central Pattern Co., Quincy, Ill.

Patterns—Stove.
Central Pattern Co., Quincy, Ill.
Cleveland Castings Pattern Co., Cleveland, Ohio
Cope-Swift Co., Inc., Detroit, Mich.
Quincy Pattern Co., Quincy, Ill.
Vedder Pattern Works, Troy, N. Y.

Pipes and Fittings—Furnace.
Central Heating Supply Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Howes Co., S. M., Boston, Mass.
Lamneck Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Michigan Safety Furnace Pipe Co., Detroit, Mich.
Safety Interlocking Stove Pipe Co., Mt. Pleasant, Iowa
Standard Furnace & Supply Co., Omaha, Neb.
Stearns Register Co., Detroit, Mich.

Pipe and Fittings—Stove.
Hemp & Co., St. Louis, Mo.
Howes Co., S. M., Boston, Mass.
Meyer & Bro. Co., F., Peoria, Ill.
Michigan Safety Furnace Pipe Co., Detroit, Mich.
Safety Interlocking Stove Pipe Co., Mt. Pleasant, Iowa
Sullivan-Geiger Co., Indianapolis, Ind.
Whitaker-Glessner Co., Wheeling, W. Va.

Pipe—Conductor.
Berger Bros. Co., Philadelphia, Pa.
Burton Co., W. J., Detroit, Mich.
Clark-Smith Hdw. Co., Peoria, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Hussey & Co., C. G., Pittsburgh, Pa.